SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[*The* MINING JOURNAL *is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.*]

1978.—VOL. XLIII.] LONDON, SATURDAY, JULY 19, 1873. {PRICE.....FIVEPENCE. PER ANNUM, BY POST, £1 4s.

Original Correspondence.

FOREIGN MINING AND METALLURGY.

ss in copper has been quiet at Paris, with a slightly down- dency in prices. Chilian in bars, delivered at Havre, has l. 10s.; ditto in ingots, 91*l.*; and Corocoro minerals (pure l. 8s. per ton. There has been scarcely anything passing in copper at Havre; the stock on July 1 comprised 1705 tons of in bars, and 250 tons from various sources, or altogether ns, or of pure copper about 1910 tons, against 480 tons at the nding period of 1872. The German copper markets have tremely quiet; there is no disposition to purchase, and prices nerally a downward tendency. There has been no appre- hange in tin at Paris; Banca, delivered at Havre or Paris, 146*l.*; Straits ditto, 144*l.*; and English, delivered at Havre 142*l.* per ton. Tin has been depressed at Rotterdam, but s now regained a quotation of 80½ fls., and Billiton cannot ed below 79½ fls. There is little to be said with respect to man tin markets, upon which there has been comparatively siness doing. Lead has been drooping upon the Paris ; French lead, delivered at Paris, has brought 23*l.* 12s. per d lead from other sources has realised about a similar price. s been supported with firmness upon the German markets. s not varied upon the Paris market; the general quotation er ton for all descriptions. The German zinc markets have iet, but at the same time prices have been well supported.

French iron trade remains stationary. Quotations in the agne district are maintained by continuation at from 7*l.* to er ton for charcoal-made pig, 5*l.* 16s. to 6*l.* per ton for coke- pig, 12*l.* to 12*l.* 9s. per ton for rolled iron from coke-made pig, l. 8s. per ton for No. 20 machine iron. In the Moselle white pig is worth 5*l.* 10s. per ton. In the Haute-Marne prices at about the level last reported. No important contracts are ed, and the tendency of affairs remains very indecisive.

uld appear that the reduced tariff adopted for the conveyance erals on the Belgian State Railways is to be applied to mineral on the Luxembourg lines. There is scarcely anything to be ith respect to the iron trade, as well at Liége as at Charleroi. nptive requirements do not absolutely make default, but at prices consumers appear disposed to await the return of r rates. There is a disposition to see what may result from mmencement of the winter season, and until then compara- few orders will probably come to hand. The strength of the tion between the coal and iron trades is being every day more ly felt. The Namur Chamber of Commerce has just published ort upon the industry of that district in 1872. It would ap- hat last year the province possessed six furnaces for charcoal- iron, of which only one was in activity; and four furnaces d with coke, of which three were in activity. The production se furnaces last year was 41,760 tons, and the number of work- mployed for their maintenance was 245. The production of ast-furnaces in the year 1872 exceeded the production of 1871 l tons. The furnaces of the Thy-le-Château Company produced ar 29,660 tons of refining pig. Hainiau (Marche-les-Dames) ced last year 10,600 tons, while the Couvin Works yielded 1395 f charcoal-made pig. The Thy-le-Château Rolling Mills fur- 32,850 tons of rails. The production of the works established Namur district for working iron was nearly doubled last year, e same may be said of the ironworks properly so called. The orks of the province possessed last year two trains for the pro- n of rails. The results attained in 1872-3 by the St. Leonard Manufacturing Company were satisfactory. The profit realised e year was 8553*l.*, of which 6400*l.* is to be applied to the pay- on Aug. 1, of a dividend at the rate of 3*l.* 4s. per share. A sum 0*l.* has also been carried to the reserve and redemption funds, similar amount has been applied to the depreciation of premises.

Belgian coal trade continues to be characterised by a good f indecision. Meanwhile, however, an advance of 10d. to 1s. 8d. n in prices is announced at some collieries in the Borinage. ral Colliery Association is said to be in course of formation in e, the object being to furnish consumers giving in their ad- to the association with a regular supply of coal at a low Each associate, it is estimated, is to profit from his member- n proportion to his interests in the association. The means the society in course of formation proposes to employ are the ng of loans to needy colliery owners, the adoption of new and mical means of production, the purchase and lease of plant, &c. romoters of the association propose to raise a capital of 80,000*l.*, his seems to be an insufficient amount, and it is not altogether that the investments made by the association must not be re- d in the light of lock-ups. Upon the whole, it does not seem that this association, if it should ever be formed, will exert a great influence upon the coal trade; it is very doubtful whether a combination would provoke a fall in prices if it were not lly brought out by other means. Upon the French coal markets asers meanwhile hold themselves very much aloof. Mention de at Lille of a contract having been concluded for Charleroi t 16s. per ton; the report, however, requires confirmation. It orted from Rodez that the local coal mining interest is pre- g to increase its production fivefold, and to carry it to 60,000 In the Pas-de-Calais exploratory operations are being every- undertaken with considerable energy. Official returns show he imports of coal into France in the first four months of this were 2,320,517 tons, against 2,381,208 tons in the corresponding d of 1872. The imports of coke in the first four months of this were 195,118 tons, as compared with 166,162 tons in the corre- ing period of 1872. The exports of coal from France in the our months of this year were 217,720 tons, as compared with 5 tons in the corresponding period of 1872. Coke was ex- d from France in the first four months of this year to the extent 130 tons, as compared with 6140 tons in the corresponding d of 1872. It would appear that in the first four months of this England sent 130,000 tons less coal to France than in the corre- ing period of 1872; the exports of coal from Belgium to France ell off to the extent of 60,000 tons; but, on the other hand, the eries of Belgian coal to France increased to the extent of 130,000 The exports of coal from France are divided over Belgium. Russia, Turkey, Egypt, and Algeria. The Carvin Colliery Com- pany will pay, Aug. 1, statutory interest on its shares, and a balance of dividend payable for 1872-3, or altogether, 2*l.* 1s. 8d. per share The Ahun Collieries Company has been paying during the last few days an interim dividend for 1872-3 at the rate of 16s. per share.

MOTHER LODES OF CALIFORNIA AND NEVADA.

SIR,—In the Supplement to the Journal of June 14 I observe a letter upon the Mother Lode, or Veta Madre, of California, by an "Anglo-American," which is only calculated to mislead your readers. He asserts that it was called the Veta Madre by the Spaniards "on account of its richness, thickness, and its characteristic of being the source and fountain of all the gold of that remarkable State." What an extraordinary statement! Anyone would infer that this great lode was known and recognised by the Spaniards prior to the occupation of the country by either Mexicans or Americans, whereas *nothing* was known about it until long after the working of the placers, and is not known yet, as he alleges, by anyone conversant with gold mining, unless he can prove that Nature has set all her laws at defiance, and acted differently here to any other part of the world. The article in the "Overland Monthly Magazine" is far more to the point—"it has now, by common consent, come to be applied." If the term Veta Madre, from its size, can be applied anywhere it should be in Mariposa, where it is the largest, and not in Amador, where its dimensions are very dissimilar. I admit that this quartz lode in Mariposa can be traced for about 60 miles, but the workings in this county, considering the capital employed and work done, has proved very far from remunerative. To increase the marvellous, he adds "that from 1848 to 1872 the gold yield of California, *all* from this wonderful Veta Madre, has produced 300,000,000*l.*, or say $1500,000,000. The united products of California and Australia only amount to about 400,000,000*l.*, and from the latter county the exact amount can be better estimated than from the former place, owing to there being a system of supervision upon the gold fields, and in the treasuries and custom houses, which California has always lacked. To show you what an enormous amount of guesswork, and how much imagination, without facts, has had to do with this calculation, I give the two returns, one obtained by Dr. Ure from 1848 to 1864, from the Treasury at Washington, and the other, "estimated," obtained by Arthur Phillips, from 1848 to 1866, and even these sink into insignificance by the side of "Anglo-American's" wonderful discovery. Dr. Ure's—

1848	£ 11,700	1857	£13,110,000
1849	1,600,000	1858	11,458,375
1850	5,000,000	1859	11,560,000
1851	8,250,000	1860	9,400,000
1852	11,700,000	1861	10,025,000
1853	12,500,000	1862	9,545,500
1854	14,100,000	1863	8,750,000
1855	13,400,000	1864	9,435,500
1856	14,000,000		

or a total of 143,796,075*l.*, including, from the time of the discovery of the British Columbian gold fields, nearly all the gold there produced. He adds, "since 1864, during the war, little that has been published is reliable." Mr. A. Phillips says, "The following is the estimated yield from 1848 to 1866," inclusive:—

1848	$10,000,000	1858	$50,000,000
1849	40,000,000	1859	50,000,000
1850	50,000,000	1860	45,000,000
1851	55,000,000	1861	40,000,000
1852	60,000,000	1862	34,700,000
1853	65,000,000	1863	30,000,000
1854	60,000,000	1864	26,600,000
1855	55,000,000	1865	28,500,000
1856	55,000,000	1866	26,500,000
1857	55,000,000		

or a total of $863,300,000, or (say) 167,260,000*l.* up to 1866. Each successive year, from 1864 to 1872, the yield in California has greatly diminished, owing to various causes, but chiefly to the labour that was formerly individually engaged at the rocker having been employed at regular wages in the silver and other mines scattered over the various other States. However, let us take the average of the last eight years from the approximate returns at $25,000,000 a-year, or 5,000,000*l.*, which is, I believe, in excess of the actual product, we have 143,796,075*l.*+40,000,000, giving 183,796,075*l.* as the total produced to 1872 under the first return; and under the second we have six years to add—from 1867 to 1872 (say) at $25,000,000 a-year, $150,000,000+$836,300,000 or $986,300,000. Now, Sir, this dividend by five gives in round numbers 197,260,000*l.*; and, therefore, you perceive in these two returns a slight difference of about 13,464,000*l.*, showing the wonderfully elastic errors in the calculations in the Treasury departments; but then "Anglo-American" has come forth with a still more elastic conscience, and adds on to the highest of these returns the mere trifle of 103,000,000*l.* sterling, or $515,000,000. Up to the year 1866 all the gold from California delivered at the United States Mint and its branches was under 48,700,000*l.*! You will also notice the discrepancies between the first year's product with Dr. Ure and Mr. Phillips. The latter remarks that it reached its culminating point in 1853, which rose in that year to $57,330,034; the former says $62,500,000, and gradually fell until 1861, when it was $40,639,080. Dr. Ure's is $50,125,000. Mr. Phillips adds, in 1867, about one-third of the gold annually produced is the produce of quartz mining. "Anglo-American" says that as the streams from the mountains to the Pacific Ocean run in a westerly direction, the Yuba, Cosumnus, and other water courses were filled with gold, and thus deposited their treasure along the flats, &c.; and that after a few years of surface and hydraulic mining the source of all this gold was found to be in this *Veta Madre*. He will find on reference to his map that all the rivers do not run westerly, for some are nearly north and south, emptying into the Sacramento.

Now, as this great lode has been traced from British Columbia in a direct line through Oregon and North and South California, and along which line gold is met with in alluvial and quartz workings in paying quantities, these rivers must have run up hill and pursue their course backwards and over the pits in a remarkable manner to have carried all the gold from the Mother Lode in the westerly side to the easterly side, where as rich deposits are met with as on the west. A celebrated writer says:—"It has been supposed that the gold found in the beds of rivers had been torn out by the waters from the veins and primitive rocks which they traverse; some had searched, but in vain, at the source of auriferous streams for the native bed of this precious metal. The gold in them, however, belongs to the grounds washed by the waters as they glide along. This opinion, at first suggested by Delius, and supported by Deborn, Guettard, and others, is founded upon just observation. The beds of the auriferous streamlets and rivers contain more gold after storms of rain upon the plains than in any other circumstances. It happens almost always that gold is found among the sands of rivers only in a very circumscribed space. On ascending these rivers their sands cease to afford gold, though did this come from the rocks above it should be found more abundantly near the source of the rivers." Perhaps as "Anglo-American" has found out the true and only source of all the gold in California he can give us with equal certainty an account of the true origin of gold, and under what process of reasoning he comes to the conclusion that the metallic bearing rock (or strata) of this free gold is to be classed as analogous to the mineral bearing strata, which follow certain laws so universally that it has become to a great extent a simple matter of practical science and study to know whether or not a vein or lode is not sufficiently metalliferous to warrant the necessary outlay for its exploitation, whereas in gold mining, either in quartz or free gold in sulphurets, or in whatever shape it is met with, no known laws will give any such certainty of success.

Quartz lodes may have been very productive and all at once will become barren, and yet not the slightest change in appearance, or alteration of the matrix, or disturbance in the country rock will appear, and no scientific researches, as far as I know, have ever solved this mystery. Again, if his theory were correct, that this Veta Madre of quartz is the only source of all the gold, what becomes of the discoveries that so many productive gold workings are in granite, as in Tuolumne, and in metamorphic slates, and in auriferous pyrites running through the quartz, leaving the latter pure and white? In volcanic beds, near which not the slightest trace of quartz is found, and very many other forms and rocks. Now, the quartz lodes are certainly in their oldest form not so old as the primary rocks, and are indeed, even in California, able to be seen as still forming at the present moment. The writer says, "It would seem, however, that the primary source (so far) of gold in these trachytes, which form the principal portions of the rocks including gold, is not in these rocks but rather in the syenites and greenstone porphyries below them." Sir R. Murchison considered that all the auriferous rocks belonged to the Palæozoic age, but Table Mountain, in Tuolumne county, negatives that theory and places those in the Tertiary age. Again, many of the richest auriferous quartz lodes belong to the Triassic and others to the Jurassic epoch. Thus your correspondent, being infallible, has laid down a law, "No gold or silver lode is reliable unless it be a true fissure vein," and the only true fissure veins upon the West Coast of America are the Mother Lode of California and the Comstock, of Virginia, in Nevada."

It is hardly possible to conceive anyone in his right mind making two such absurd and utterly untrue statements, but the "true fissure vein" is in the mouth of so many in this country who are but little acquainted with mining, that it has become a byeword, although very little importance should be placed in it, for here it is generally meant to signify one that traverses a rock parallel to its stratification, which is truly a bedded vein, and it is immaterial whether the veins are split up or run in parallel lines, they are still given the same term if they run to any depth, whether productive or barren, and more particularly if they have a bearing corresponding with that laid down in any particular section where a mine has been very rich of the same character or species. For instance, your correspondent says this Mother Lode runs in a northerly direction along the slope. Now, very many of the best mines in that country are not true fissure veins, and do not run northerly and southerly, but run east and west, and are contact veins, and I can affirm this to be the case from a very long and varied experience in gold and silver mining. That portions of this Mother Lode, as it is here called, pay well for working is freely admitted, but it is only of late years that Americans would place any faith in deep quartz mining. Eleven years ago, when I urged in this same Amador county, and many others, the continued prosecution of deep mining in quartz as it was carried out in Australia I was only laughed at. Some few there were then who were so engaged, and, although working under great disadvantages, persevering!y continued, and have been successful, though the greater part had to give in from impecuniosity.

In most of the northern counties of California the lodes run north and south, in Tuolumne and Mariposa they bear south-east and north-west, others, as I have before remarked, run due east and west. In Amador county, of which your correspondent so particularly speaks, the lodes or veins are not continuous, but run in parallel belts. Of the Hayward and Amador claim, Mr. A. Phillips says in his report—"It (the first-named) was formerly called the Badger and Eureka, and in the latter there was an average width of 8 to 20 feet and in the former it swells out to 40 feet, though disappearing altogether at its extremity." These mines may be said to be worked rather on a large chimney or pipe vein than on a regular quartz lode. The Eureka, North Star, Sierra Buttes, and other exceeding rich mines, all run east and west. In the Alpine claim, again, there is a thickness of 40 feet of totally unproductive white quartz beneath the productive band. Your correspondent makes a similar error when he speaks of the silver-bearing vein the Comstock, of Virginia, Nevada, as being the only fissure vein on the West Coast of America, and that no others are at all reliable. He certainly could never have been much over the mining regions of the West, or he might have seen many, both fissure veins and other veins, quite as reliable and rich as his true fissure veins. Had the mines in Austin, Nevada, for instance, been worked with the same perseverance as Virginia City, and upon any system at all, save that of garroting and robbery, there would be found to be an equally large, and I make no hesitation in saying richer, lode than the Comstock; but ignorance, bad management, and theft have brought that part of the country into disrepute, after extracting from the surface, as it were, unparalled amounts of silver from the extent of ground worked, and so with many other localities.

What does "Anglo-American" say to the Mammoth silver lode, extending for many miles from one point of Texas into Chihuahua, passing under the Rio Grande, in which are several of the great mines worked long before mining was ever thought of in this country? I have no exact data by me to give figures, but I know of no part of California that has produced quantity and quality with some of the Victorian gold fields—Bendigo, Forrest Creek, and the deep alluvial deposits of Ballarat, or where there is any similar

discovery of large nuggets. Can the quartz reefs here produce larger returns than some of the reefs there—to wit, Ararat, Pleasant Creek, Ballarat, and many others? It there were less "gas" used in speaking of the undisputed riches and resources of this country, but statements confined to facts, and less of the usually depraved methods resorted to in bringing American mines before the British public, we should see ten times more capital invested, and invested most profitably, and there would there be an end to the distrust and recrimination but too justly manifested by a willing and wealthy public who are desirous of investing their money here, but who are deterred from it by the systematic scheming and plundering that are so universally practised. HUBERT BANKART, M.E.

New York, July 4.

MINING IN COLORADO—THE POLLICK DISTRICT.

SIR,—Since my last letter I have been able to examine some of the mines in this district, and also in the Pollick mining district, in Summitt county, and a few particulars of the present and future prospects of these reputed world-renowned mines will, no doubt, be acceptable to the readers of your valuable Journal.

In this, the Buckskin, district there are the Philip's, Sweet Home, Wade Hampton, Bates, Washington, and McGrow lodes, all of which, except the Philip's, are up to and above timber line, some of them being from 1000 to 3000 ft. above, which makes them difficult to get at with provisions for the men and the transport of the minerals, which have all to be brought down to timber line, and in some places two or three miles below, in packs, which makes it expensive for low grade ores such as those lodes contain, the average yield being about 52 ozs. of silver to the ton, and after deducting $40 per ton for smelters' charges, I cannot see that they can by any means be made to pay the cost of working, as the veins are in general small, varying in size from 10 to 14 in. wide, and embedded in a porphyritic trap, hard for exploring, costing from $15 to $20 per foot in drifting, and from $18 to $20 per fathom for stoping, besides the expenses of carriage, &c.; and yet, in the face of these facts, these mines are represented by persons and the press to be the most profitable in the world.

In the Mount Lincoln district the principal mines are the Moose, Hiawitha, Baker, Elephant, and many others, not worthy of notice. These mines are all in the limestone formation, and are nothing more than deposits, or pockets, which are deposited in between the layers of lime; and although some very rich pockets have been taken out from the Moose, and some of the other mines, I fear that as they get into the mountain they will not be found so productive. I saw one man while passing over this mountain who opened a pocket within 2 ft. of the surface, and in one month he took out $7000 worth of ore, and that was all he could find. Since that time he has been drifting in every direction, and has spent all the money he took out of the first pocket, and about $7000 more, and has not seen a stone of ore for all the money spent. Such are the mines on Mount Lincoln: when one pocket is gone you have to discover another, without any indication whatever to follow or to guide you; and I fear there cannot be sufficient ore raised in the district to supply the smelting works already erected, much less those they are talking of erecting, unless they reduce the price much below $40 per ton, which appears to be an exhorbitant price, and perhaps may come down when other works are got into operation.

In the Pollick district there are some good lodes opened up, and are still opening. I have just returned from that district, and am pleased to say that my opinion of it is far beyond any other that I have seen in Colorado, the lodes being regular and well defined, embedded in granite and trap rock, and intersected by elvans, where rich deposits of mineral may fairly be expected.

The mines, or rather the lodes, that I this week inspected are the Hunter, Vanderbilt, and the Virginia. The Hunter is a fine vein, in the primary rock, and will average from $300 to $400 per ton in in bottom of the shaft, 60 ft. deep. Remarks on this property have already appeared in your valuable Journal from me, which I am happy to say have been more than realised as the operations have progressed; therefore I need not trespass on your space with any further remarks on that property at present.

The Virginia is a well-defined lode, and can be worked to any depth by means of an adit level, and, from the samples taken by me, will pay well for working, being near a 15-head stamp mill, with all other appliances for efficient working.

The Vanderbilt is in the same mountain as the before-named. It is 9 ft. wide between walls, and I may say for the present depth, about 10 ft., it is the richest lode that I have ever seen, the gold being visible to the naked eye throughout the breadth of the lode. In fact you cannot break a rock that gold is not visible in it, and it appears to be improving in depth. A piece from the bottom of the pit, or shaft, I herein enclose as a fair sample. H. B. GROSE.

Philip's Mine, Buckskin, June 20.

MINERALOGY—No. V.

METALS:—THEIR HISTORY, CHEMISTRY, GEOLOGY, PHYSICAL PROPERTIES, USES, AND COMMERCIAL IMPORTANCE.

SIR,—The absolute existence of *native iron* remains a debateable question, but one involving most interesting details, inasmuch as it would appear that the only guaranteed specimens of this substance—*i.e.*, iron not chemically associated with other elements—is supposed to owe its origin to other and very distant spheres. As no profitable result can possibly attend a dissertation upon the existence of native iron, I will content myself with quoting instances of its discovery, as given by Dana, the great American mineralogist, as matters of interest. A mass of meteoric iron (locality not given), weighing 1635 lbs., is preserved in Yale College, U.S.; one piece, discovered in the district of Chaco-Gualamba, South America, is estimated at 30,000 lbs.; another, found at Bahia, in Brazil, weighs 14,000 lbs. Beyond these, the most remarkable specimens of meteoric iron are those discovered in Siberia, Mexico, Peru, at the Cape of Good Hope, and at Elbugen, in Bohemia.

Capt. Parry, in his narrative, speaks of a huge *meteorolite* found on an island on the north coast of America, utilised by the Esquimaux in the manufacture of all the iron tools they possess. Of the various combinations of iron, in nature, with other elements it may with justice be said they are legion. Of these by far the greatest abundance are its chemical union with oxygen, sulphur, and carbonic acid, the first two ultimate elements, the last-named being a proximate one. Being isomorphous with manganese, magnesium, chromium, calcium, aluminum, and various other bodies, we are not surprised to find the oxides of these metals constantly replacing each other, and hence the varieties of combination yielded when iron ore is subjected to chemical re-agents. Iron is readily acted upon, also, by acids; it is, therefore, nothing unusual to detect the presence of arseniates, sulphates, phosphates, tungstates, and chromates, interfering, and in nearly every instance prejudicially, with the practical working of the metal. Iron is also frequently found associated with other metals, and occasionally silver occurs in proportions which demand special attention, first of the assayer, and secondly of the economist. Thus, my attention having recently been directed to a specimen from Anglesea, I detected this precious metal to the extent of 8 ozs. 3 dwts. 8 grs. per ton. The most universally diffused compounds herein enumerated are those of the metal with oxygen and sulphur, the former combination as simple oxides, and constituting also a numerous class of complex bodies. The following formula exhibits the primitive forms and composition when pure:—

	Symbols.	Atomic weight. Iron.	Oxygen.	Percentage composition. Iron.	Oxygen.
Protoxide	$Fe\ O$	28	8	77·7	22·3
Peroxide	$Fe^2\ O^3$	56	24	70·0	30·0
Ferric acid	$Fe\ O^3$	28	24	53·9	46·1

As neither the first nor the last named are natural products, their consideration may be passed over with a mere glance. Associated with peroxide of iron, the protoxide constitutes one of the most important ores in nature, and, in the form of *magnetic iron*, is employed for the production of the finest steel. Though found largely in many other portions of Europe, magnetic iron is not abundant in Great Britain. Its physical characteristics are cubical crystalisation, principally octahedron and rhombic dodecahedron, iron-black colour, streak black opaque. It sometimes occurs with a slight green or brown tinge, strongly attracted by the magnet, and occasionally polar (I possess a specimen of this from Canada), sp. gr. from 5·2 to 6·5; it varies in texture from coarsely crystaline to finely granular, and that rarely massive. Composition, when free from extraneous matter, $Fe\ O + Fe_2\ O_3$, yielding 72·40 metallic iron and 27·60 oxygen. Magnetic iron ore occurs principally in primary formations. Hence its abundance in Scandinavia. From it is extracted the Swedish iron, famed for its excellence and adaptability in the manufacture of steel. The main deposits of this class of ore in Europe are Dannemora, Arundel, Siberia, Corsica, Hartz, and the Island of Elba, and in numerous localities in North America, where the extraction of impurities is effected by the employment of powerful magnets. Its chief occurrence is in gneiss, occasionally in limestone, and it is usually associated with hornblende, chlorite, quartz, felspar, and basalt. According to Sir W. Logan, magnetic iron ore is found somewhat abundantly in the Laurentian rocks of Canada, particularly in the gneiss and metamorphic limestones of the basin of the Ottawa. The following formula may be regarded as a fair representative of the type of this important mineral:—Peroxide of iron, 27·50; protoxide of iron, 59; silica, 13·0; lime, 0·50; protoxide of manganese, 0·10; with extremely minute but variable proportions of lime, magnesia, alumina, carbonic acid, water, and sulphur. My own analyses gave upon several occasions—a specimen from Norway, 57·94; one from Devonshire, 58; another from Portugal, 62·07; and a fourth from Cumberland, 63 per cent. of metallic iron. By calculation it will be seen that the specimen I have above selected as an average is about 60 per cent., and the total results exhibit 1 atom of iron combined with about 1½ of oxygen. W. WHITE.

Laboratory and Assay Office, 25, Finsbury-place, E.C.

ON METALLIFEROUS VEINS.

SIR,—I am pleased to find by a letter in the Supplement to last week's Journal that Dr. Whitworth entirely agrees with my views in reference to the principal subject of my paper—that of the dip of the best lodes *towards* elvans or granite. But on cross-courses and slides he has expressed himself differently to what I understood him to say at the meeting referred to. However, as my paper had only an incidental allusion to cross-courses, and none whatever to slides, the subject now touched on is not only new but is a very wide one; and before I express any opinion on those faults, and their probable effects on metalliferous lodes, I shall be much pleased to get the Doctor's views on the subject. For instance, just to show in what way they may be supposed to facilitate the deposit of a bunch of tin in any given lode, without at the same time getting some of the same kind of metal and the accompanying crystaline matter also in their composition.

I have carefully examined large numbers of those faults in various parts of the two western counties, as well as out of England, in their immediate connection with lodes proper, and have formed a very decided opinion on the subject entirely from such observations, and the Doctor has also formed his, and is apparently anxious to ventilate it. I think many af your readers will be pleased to read any remarks we may offer on such an interesting subject; at all events one will be, and that is— S. BENNETTS.

July 15.

STEAM COAL:

BOARD OF TRADE ENQUIRY RESPECTING THE EXPLOSION AND CONSEQUENT LOSS OF THE STEAM-SHIP ZENO.

SIR,—This enquiry was opened a few weeks ago at Hull, by the stipendiary magistrate there and two nautical assessors appointed by the Board of Trade, when the Court had no difficulty in arriving at the fact that this splendid and well-appointed ship was sent to the bottom by the explosion of gases generated in the coal bunkers, which, with the adjacent part of the forepeak, had been for many hours under the hatches, and the gas having escaped into the forepeak exploded in consequence of a naked candle being brought in contact with it. From the effects of this the vessel went down headlong in less than 20 minutes, with a cargo of 2000 tons of "Cardiff hard brittle coal." This fact being established, the Court adjourned to July 8, to obtain scientific evidence as to the quality of the coal and its liability to explosion. For this purpose my partner, M. Pierre Adolphe Vassard, Member of the Polytechnic Society of Paris, and of the Chemical Society of Paris, was called in, and delivered an elaborate opinion on the origin and nature of coal; a subject of the deepest interest to all employers of steam, and especially to steam-ship owners and shippers of coal, whether as cargo or for ships' use. This report merits reporting *in extenso*, and as I have it so prepared, should you deem it suitable for your columns, I shall be glad to furnish you with a copy of it, leaving the insertion, *in toto* or by fragments, as may suit your convenience. W. WHITE.

Laboratory and Assay Office, 25, Finsbury-place, E.C.

[We shall be glad to receive the report referred to.]

ON THE GREAT MONOPOLY OF BRITISH COAL.

SIR,—The Parliamentary Committee has finished its enquiries into a subject on which many of its members, as committeemen, ought never to have been consulted—as they have, no doubt, a direct and positive interest in the maintenance of the shameful monopoly which the committee are supposed to wish to break up—and the witnesses have been, in many cases, men with prejudiced, or partial, notions as to right or wrong, according to the position in view, or light in viewing. (See the Chameleon Investigation fable.) Then comes the "Times," blowing hot or cold, just as it suits: muddling or mixing up the evidence just as it wills.

Now, Sir, if you will kindly permit me, I will, as a thoroughly independent, unbiassed, practical man, endeavour to point out the cause of the great evil, and then suggest a remedy. In the first place, I can prove by undeniable facts that the shameful imposition of high-priced coals—now inflicted on the public, and the workingmen (who feel it most severely)—is the work of coal owners and coal merchants. The greater ill-doers are the middle salesmen—taking their mid-place—who work up imaginary panics, and share with the other two in the public plunder! All three are, of course, highly indignant at being, for a moment, supposed to be guilty of filling *their* pockets by picking the pockets of the public! Yet, such is the fact; and, as a paltry excuse, they throw dust in the eyes of the public—by saying that it is the working miners, or coal getters, who are the delinquents, and not themselves. The investigation has done some good; and the public, if not blinded with coal-dust, &c., will, with a strong hand, put down this gigantic monopoly.

From facts compiled from the evidence, I find that 120,000,000 tons of coal were raised at the pits' mouth during 1872, by men and boys numbering 400,000 collectively, which may be subdivided into 100,000 hewers or getters and 300,000 helpers—the average annual tonnage raised per individual being 300 tons, at a cost of 1s. 8d. per ton for each hewer, and 2s. 6d. per ton for collective helpers, showing 4s. 2d. per ton for labour cost in raising coal, which gives at once flat contradiction to the false assertions that the cause is the effect of overpaid workmen—who are now charged with wishing to limit the stock or production of coals required, which is as false as the other charge.

A great improvement is necessary at the coal mines (as suggested by Messrs. Normansell and Elliot), and if the men, as a mass, will study their best comfort and advantage in every way, they will at once adopt the proposed double-shift, or alternate day and night workings of eight hours, with intervals of four hours for ventilating and clearing the pits. For instance: from 12 midnight to 8 A.M. (night gang); 8 A.M. to 12 noon (clearance); 12 noon to 8 P.M. (day gang); 8 P.M. to 12 midnight (clearance); then the day and night gang should change for a week, alternating on the rules of fair play, and a larger amount of cash would be easier earned, and a greater quantity of coals be sent to the pit's mouth. I calculate, with good management, one-fifth more yearly would be the increase and benefit, and 144,000,000 tons, instead of 120,000,000 tons, be raised easier than at present, with satisfaction to all around, and without adding to the 400,000 working staff. Co-operation, and good manly English spirit from one to the other—master and man—driving out the middle man (who is the curse of everything)—arbitration of disputes by competent practical honest men, selected from masters and men conjointly, would soon annihilate wretched strikes cheerless homes. THE WORKMAN'S FRIEND

P.S.—Presuming that want of space was the cause of the appearance of my letter in the Journal of last week, may I favour to have the following addenda, or continuation of marks, included, if possible, in the next issue. As to practi rangement for mine works, I would submit 312 days, or 52 6 days each, to constitute the current year. From this ded holidays in the year (inclusive of Good Friday, Whit Monda Christmas Day), which leaves 283 working days, or a pit ho once a fortnight for relaxation and amusement. Saturdays wou most preferable for holidays, as the Sunday (as a day of rest) permit of a recruit after the holiday, and the workmen woul fresh for their work on the Monday. If foul weather should fa either of these holidays, the substitution of the following Sat would make up for it. These holidays should, if well con for true enjoyment to all, be arranged by a combined committ managers, masters, and men.

REMARKS ON TIN-DRESSING, AND STAMPS GRATES—No

SIR,—In my last letter I endeavoured to show that the succ ful concentration of tin depended to a very large extent on the and judgment exercised in the assortment and separate treatme the different classes of ore which are found prevailing in the e blished tin mines of Cornwall; and, as a sequel to that and the preceding letters on the subject, I have thought that a few ge remarks on tin-dressing may not be out of place, or wholly de of interest. To begin with, it may be observed that a similar unif routine is maintained in the dressing as in the stamping of tin The stuff is brought to the surface and passed onwards to the sta and thence to the dressing-floors, subject almost indiscriminat a similar mode of treatment just as if a uniformity of character quality prevailed in the lodestuff throughout the mine, and als if the process of dressing were mechanically perfect, and needed little if any supervision, therefore the disposal of quantity s rather to be the object than the conservation of tin.

In the dressing of tin two considerations should be paramou first, economy as to the expense; and second, completeness as t operation and its results. Two important considerations those— first respects the cost price of the raw material, so to speak, and second, its commercial value as a contingency of the manner in w it has been treated and improved. If the cost of production re lessened, and the commercial value of a commodity be increa the same time, a difference of two to one in favour of profits is secured. The concentration of ores means their separation fr non-metallic minerals with which they are mechanically co It is, therefore, essential to the success of concentration that associate minerals sought to be expelled should be fully unders their relative proportion, and specific gravity to the metallic mine which are intended to be secured; otherwise, how is it possibl know by what means their separation may be most satisfacto effected? During the process of dressing most of the heavy mine are concentrated together with the tin, and beyond a certain po no further separation can be effected by mechanical means, unti change has been chemically produced in the relative proportion one mineral to another, and this is done by heat, which causes an pansion of the interstices of chemically combined atoms beyond range of force of cohesive attraction. Besides which heat as a oxidising and a desulphurising agent removes a very large percenta of the non-metallic elements—such as oxygen, arsenic, sulphur, c bonic acid, &c.; this causes a disintegration of many of the n metallic minerals, and renders them relatively inferior in point specific gravity to the oxide of tin.

A proper system of dressing, like that of a satisfactory assortme of the ores previous to stamping, to be properly conducted has to commenced at the beginning, or else losses will accrue, which c not at any subsequent period be remedied. I have endeavoured show that an assortment of the ores previous to stamping is al compatible with true economy, and I have now to add that an imm diate classification of the stamped ores should always precede attempt at their concentration. This process of separation should wholly for the purpose of sizing, in order that when concentrati was commenced inequality of size in the non-metallic minerals sho not counteract or equalise the greater specific gravity of the fi particles of the metallic minerals. Different sizes having differ specific gravities will require different volumes of water and diffe ently arranged instrumentalities to effect their separation one fr another. I as much believe that one nostrum or prescription c cure all diseases as that a uniform mode of treatment is adapted the proper concentration of all kinds of tin ores. Whatever may the nature of the mineral ingredients entering into the composit of tin lodes, the separation of the crushed ores into uniform class as to size is a general necessary condition, and applies with more less importance to all lodes. The dressing of slime is an importa part as effecting the returns, and as a consequence the pecuni results, of tin mining.

It is these, I presume, which cause the greater part of the los complained of, though some tin is no doubt lost in the rows fr not being stamped fine enough. Losses occurring from stamping t fine and not fine enough at one and the same time, appears to me a very natural result of not assorting the ores before sending the to the stamps. There can be no doubt but that the generality slimes are very poor, but then a large quantity of the tinstuff is r duced to slimes, and if they are on an average poorer than the oth parts the tin contained therein would net a large amount per ann from even a single mine of the larger class. The construction of slime pit has very much to do with the quality of the slime it e tains, and so we repeat has the stamping, also the assorting of stuff previous to its being stamped, and also the character of matrix of tin. It matter very much in this respect whether matrix consists of clay, lime, or quartz; the latter would yield least slimes, and by far the best. It is not one thing merely many which require to be attended to in the preparation of tin the market. I am of the opinion that undue haste is sometim practised in the early stages of tin-dressing, it being taken for grant that the liability to loss whilst the percentage of the stuff is com paratively large is much smaller than at the advanced stages, but pro portionally it is not, and if a proper separation of the slime fro the rows is not previously affected the loss of tin during the ear stages must be proportionately larger. So much care is certain not taken at the early stages as there should be, and sometimes muc too large a stream of water is used, dispatch appearing to be th principal object, and very little of the dresser's attention is usual given to the first stage of buddling. Apparently it would seem if it were taken for granted that little attention was requisite unt the stuff was reduced in bulk, and the quantity of tin proportionall increased; whereas, on the contrary, the larger the area the greate the liability to loss, and if laxity of supervision be superadded th system becomes loose indeed, and the losses proportionately greater Framing low quality tinstuff is a very expensive process, and other wise objectionable, as its liability to loss arises in some measure from the sluggishness of the operation, which sluggishness is an inevita ble consequence of the preponderance of poor particles over the good and the limited quantity of water which such a condition necessitates It is scarcely conceivable that many individuals could be found suffi ciently slow in their movements and extended in their negative qualities—patience, &c.—to make good framers, so long a time being required to work over a comparatively small quantity of stuff, and scarcely any visible result after the patience has been so sorely tried in the operation. I think differently arranged convex buddles would obviate the necessity of putting so much of the stuff to the frames. Buddles some of greater and others of less dimensions, and more or less inclined according to the character and quality of the stuff to be operated upon. A difference, too, might be advantageously made in the cone of the buddles; for some stuff a cone 1 foot diameter at the base would be sufficient, whilst for another kind the frustrum of a cone having a diameter at the base of 3 feet or upwards would not be too large. By such an arrangement a greater space would be afforded for the subsidence of the tin at the head, and at the same time a larger dilating surface intermediately, wherein the finer and lighter particles of tin would be likely to repose. The principle of

convex buddle has always appeared to me as being far superior the concave. Descending water acquires velocity, and concentera water an increase of force, proportioned to both its velocity and lume. In concave buddles tin carried downwards from the riphery has less and less chance of subsiding until it reaches the rtex, when it subsides too fatally. But the principle of the convex ddle is opposed to that, the water and stuff expands, spreads over reat surface, and particles which escape from the centre may side somewhere within the limits of the salvable part of the ddle and be reclaimed. Various contrivances have been adopted m time to time for separating slime from the sand by the natural ion of water instrumentally adjusted, but I do not think that anying is equal to the application of manual labour for such a purpose. fessor Hofmann's slime separator is as good a contrivance as I e yet seen, but I would neither adopt or recommend it for tinssing. I intended to have given a diagram of that arrangement th this letter, but my time will not permit, having already devoted reat deal more to this subject than I had any intention or direct erest in doing.

MINE AGENT.

PROFITS, AND MINE DUES.

SIR,—Your Cornish correspondent observes that the question of ne dues must ere long come to the front, and he suggests that speculative element should run *pari passu* in both mine lords mine adventurers; and that dues should not begin to be paid ll dividends are returned, whilst their existence should be deident upon profits. The fallacy of such an argument it is scarcely essary to point out. If the adventurers were drawn into the deopment of mines by the machinations of the mine lords the would be different, but, in fact, they make the arrangement h the lords that instead of paying rent in any other form they ll give up one-tenth, one-twentieth, or some other proportion of mineral raised, as the case may be. Your correspondent argues until profits are made, and in the interval of depression, a mine uld pay fair agricultural rent for land occupied, with compenion for surface damages, but nothing more. The absurdity of s a proposition is only equalled by that which follows—that in event of the adventurers working the mine improperly, and the trators appointed upon the petition of the mine lord declaring the lord has suffered such injury as to entitle him to practically el his grant, he must compensate the adventurers, because the ct is in his favour. This may be a Cornishman's idea of justice, judging from the fearful extent to which out-adventurers suffrom their connection with questionable Cornish mine adven-rs, they probably really do entertain some such feeling; but it not such justice as is calculated to promote prosperity amongst mining community.

t cannot be questioned that every 1000*l.* worth of ore taken from mine lord's estate lessens the value of the estate to that extent. when the dues are one-twentieth the lord only receives 50*l.* for h 1000*l.* worth of depreciation. Practically he suffers from deeciation as much as the adventurers, because his dues are reduced proportion to the fall in the price of the metal mined. It is unifiable to compare mine dues and agricultural rents, because in one case the property is permanently damaged by the tenant's egation, and the owner shares the risk; while in the other the perty is not damaged by the tenant's occupation, and the owner e not share the risk. Agricultural land let at 2*l.* per acre per num would always yield the owner 2*l.* per annum, and upon the iration of the tenancy might probably have increased in value to 10s. per acre per annum; but I never heard of a mine sett being nted at one-twentieth royalty increasing in value by the end of tenancy, even to the small extent that would permit of its being ranted at so small an advance as one-eighteenth royalty; a fine renewal representing an almost infinitesimal amount of royalty e most a mine lord ever obtains. The 10,000*l.* fine on renewal Devon Great Consols only represented about two months' ore, alough the amount itself appears large. From long connection with ning, I do not hesitate to say that, taking a period of seven years, adventurer obtains a fair interest for his investment, and I conder it most unmanly whenever a few months of depression occurs resort to false arguments to endeavour to show the injustice of ne lords.—*July* 15.

ADVENTURER.

CORNISH BYE-WAYS—No. II.

RADLEY ZELLAND, MINER.

SIR,—I saw him toiling homewards somewhat painfully on the t road from St. Austell. He was in his miners' dress, which, as afterwards explained, was occasioned by the absence of a changeuse on the mine where for the present he was engaged. His coat trousers were so stiffened and besmeared with mud that I have doubt, had the experiment been tried, they would have stood right by themselves on the highway, like the sheaves of Joseph. shall not attempt to describe his hat, furrowed with drippings m candle grease, but refer the curious to the illustration in the een's book. His face was totally unlike that of an ordinary Engman. I have considered the matter, and now remember that the y place out of Cornwall where I have seen the same type was in r own city. In the garish, flaunting casinos of Ratcliff-highway abre, melancholy looking Brazilians and Lascars may be seen posedly taking their measure of vice. The why or the where-e I know not, but the face is the same.

I followed him leisurely, feeling pretty sure that he would pause take breath opposite the historical scarred hill on his left—a ing memorial of the enterprise displayed in working the Great lgoth Mine. I have passed the place frequently, and am accusned to having two facts strongly impressed on my mind by those th whom I come in contact. These are—1st. It will cost 60,000*l.* re-open Polgooth.—2nd. It will pay. I find Mr. Zelland is of the ne opinion, on my overtaking him. By way of apology, he adds he was stopped, Sir, when tin fetched 45*l.* per ton. In my time have worked in many mines, but never saw anything like the big lgoth lode. He is a fine one, he is, never turning nor twisting, t holding straight on through Wood Close, and so on west."

Did he know Great Hewas? Yes he did: remembered it as a y, when they raised 50 and 60 tons of tin a month. Worked on own hook on the lode outside the sett, but did hear a London party d got it, and called it Hewas Consols. Could he drink a glass of er? Of course he could, always could. It was main dry work derground. Had he worked in deep mines? Yes, when he was nger, down west. East Wheal Rose was pretty deep when he t her. That was the mine for silver-lead. Had seen lumps of ver ore as big as horses' heads come up in the kibbles.

I now realise from conversation some of the horrors of working deep mines. This poor man, it appears, at one time in his life alked twice a day eight miles to his work, then descended to the 0 fm. level—that is, he penetrated near a quarter of a mile sheer to the bowels of the earth. Hemmed in at a damp end, amidst awful gloom, and silence broken only by the hoarse fall and rise the pumps, by the flickering light of the candles, Radley would il away, breathing foul air, till his core (eight hours) was finished. en he might go. I despair of describing how he had to reach surface day after day. Those who pass under the Thames by subway experience a languor on ascending the spiral staircase. et the air be trebbled in hotness and foulness, and the experimenlist detained in the tube for eight hours; then, to make the comrison complete, let him commence ascending a height four times altitude of St. Paul's, not by this staircase, but by ladders dripng with wet, and rendered slippery with sticking clay. In a few nths Radley found himself a changed man, passed restless nights, ith intermittent expectoration, and all the premonitory symptoms decaying lungs. He returned here, and no doubt thus saved his fe. His father, who died in 1820, lived to be 90 years of age, and ade several pounds from wrecks, when the coast was less strictly arded. A study of the Zelland family tree I find to be an epi-my of Cornish history. The grandfather was a smuggler, and anded many a cargo in a certain sequestered cove between Fowey d Pentewan. One of the godless band enticed a fine East Indian on the rocks, by driving a donkey on the cliff with a lighted thorn fastened to the animal's tail, and a hind leg tied up. The captain mistook it for the revolving light of a lighthouse, and every soul perished.

A house is pointed out to me where, as tradition goes, about the commencement of the last century a strange uncouth man forced himself on the family, and took up his residence up to the time of his death. His past life appeared a closed book, and his temperament was so brutal and morose that few ventured to question him. Save that he mysteriously disappeared at irregular intervals for weeks together, he became in time to be looked on as a regular resident, and one of the family, paying liberally for the rough and ready accommodation he required. At his death, on administering to his effects, there was found a large pile of Spanish doubloons, a quantity of foreign jewellery, and several gold chronometers, which, with several suspicious documents, plainly showed that the man had been a pirate. He lies buried in a wild churchyard among the moors.

Here I was obliged to bid farewell to honest Zelland. He said it had done him good talking over the past; and certainly the clayey armour in which he was encased seemed more yielding and accomodating, or the man had gained fresh energy, as he passed from my sight over the hill.

MONTHLY TICKET.

RE-WORKING OF DEEP MINES.

SIR,—The great losses sustained by the re-opening of abandoned deep mines should be regarded as so many cautions against the practice. I do not know of one that ever paid, but I know many that entailed heavy losses upon the speculators in them. I will mention a few.

GREAT WHEAL VOR between the years 1815 and 1844, when it stopped (I mean the *old* mine), yielded a profit of 272,000*l.* No one thought that it would be worked again, because if it would not pay the old company how would it pay a new one? Strange as it may appear, few mines stop long before a report gets abroad that they ought not to have stopped, and in the case of Great Wheal Vor agents made out a good case for re-working, and a company was soon formed (about the year 1852) for resuming work. Several large engines, including one of 90-in., &c., were erected, and the water pumped out to the bottom—about 300 fms. from surface—but they did little or nothing in the way of sinking. In the bottom level the lode is very hard and large, and would pay for returning if near the surface, but not at that depth. The new company worked about six years, and left the old mine with a loss of 250,000*l.*!—nearly as much as the previous company gained, and this notwithstanding all the profit made at the Wheal Metal part of the sett, where they are now working.

GREAT WHEAL ALFRED was worked by a company (which stopped about the year 1818), with a profit of about 100,000*l.* About the year 1824 another company re-worked it, and lost 80,000*l.* Afterwards another company worked it, and lost 150,000*l.*

EAST CRINNIS, near St. Austell, was worked by Messrs. Taylor with a profit of about 110,000*l.* Afterwards another company reworked at a loss of 150,000*l.*

GODOLPHIN, in Breage, discovered by miners about the year 1800, was worked by Messrs. Williams and Co. till 1810, with a profit of 90,000*l.* Subsequently a company was formed in London, and they lost about 150,000*l.*

HALLAMANNING AND CROFT GOTHAL originally gave good profits, but lastly great loss. The same remark might be made concerning many other deep abandoned mines. These instances show the folly of re-working exhausted mines.

CRENVER AND WHEAL ABRAHAM is another instance of the resumption of ancient workings. If the machinery were not *in situ* I would say, if asked, "Do not touch it," but the excellent machinery being at work it is certainly advisable, in my opinion, to try a little further in depth. Tin, as in other analogous mines, may come in, if not copper.

The late Capt. Wm. Brenton, in the year 1832 or 1833, hearing of an old mine called TRELIVER, in St. Columb, not very deep, took the evidence of ten old miners as to the state of the mine when it stopped. They all described it very particularly, and said that in certain ends tin would be found. On the strength of their evidence he caused an engine to be erected, but he found no realisation of the predictions. After a year or two he left off with the loss of a few thousands.

Speculators in mines cannot do better than look out for old men's workings, and follow them, as a rule. They discovered most of the lodes in Cornwall and Devon. They worked shallow, and only where metal was found.

Everyone who knows the Clifford Amalgamated Mines know that they are poor—that is to say, will not pay the cost of working. There is, doubtless, a great quantity of ore left, but not sufficient to pay, and yet I dare suppose, looking at what has been done, that within 50 years hence a company will be formed for re-opening them; aye, and Poldice and Tresavean too. The bad character of a mine, like that of a thief, improves by time. People forget the real state of things, and hope good. I regret that the capital of our moneyed men has been so frequently mis-directed, employed in re-opening old, poor mines, when there are so many shallow ones untried. I regret, also, that so large a portion of their subscriptions have been absorbed by selfish promoters. To pay a reasonable sum for a good or very promising mine I would not object, but the sums charged and received by some promoters in London are disgraceful. Two-and-a-half years ago I was in London, when I was informed that some brokers got out five mines in Wales, with a capital of 191,000*l.*, out of which 167,000*l.* went into their pockets as promotion money. I am as much surprised at the credulity of the investors as at the greed of the brokers.—*July* 16.

S.

CRENVER AND WHEAL ABRAHAM.

SIR,—My attention has been drawn to a letter in your paper of July 12, headed "Crenver and Wheal Abraham," signed "R. Symons." The object of the writer in sending you such a composition is not clear to me, particularly when I look to the ending of his letter, where he says: "If I could have my way the mine should be tried a level or two deeper before abandoned." For the information of your readers I will tell you that we have no intention of abandoning the mines. At the present price of minerals, we are raising tin and copper worth, and realising, at the rate of about 14,000*l.* to 15,000*l.* a-year, all coming from discoveries made since the formation of the present company. We are daily expecting other discoveries, and our uncalled capital amounts to about 26,000*l.*

In some instances observations about abandonment of working a mine might depreciate the commercial value of the shares on the Stock Exchange; in our case it is not possible to depreciate our shares in value, as they stand at so low a figure.

DIRECTOR OF CRENVER AND WHEAL ARRAHAM
July 16. UNITED MINES COMPANY (LIMITED).

EAST BASSET—NEW MANAGEMENT.

SIR,—Miners are not much used to writing letters for newspapers, so that I hope you will excuse all the errors that you may find in this scribble. I have been working in a great many mines during my 60 years' life—and you know that 60 years is a tolerably long life for a miner—and have, therefore, seen and heard a good deal about the doings of adventurers, mine agents, and men in general; but I am not going to say all that might be said about the proceedings at East Basset; but this I will say, it was high time to change the management, for it was quite apparent that the late manager, from some reason unexplained, wanted to stop the mine. It has been said that there was a secret intention to stop it, that the sett might be added to Wheal Basset. How far that supposition is true I cannot presume to determine. Certainly the supposition would appear justified by the circumstances in which the late manager left the mine; for he left it without stores of any kind. A mine so destitute of materials I never worked at before, and guess I never shall again.

The company, and the miners working here, may well rejoice at the recent change in the management. Capt. R. Pryor, who is now the manager, is a first-class miner, and a man who clealy intends to do what is right between the company and the miners. I attended the pay and setting on Saturday last, when Capt. R. Pryor addressed the men in front of the account-house in a very fair spirit. He told them that he was sorry that they had such a bad pay (averaging about 40s. a-head), wages on which, he said, men cannot maintain themselves and families. He told them that the bad pay given to miners had driven them out of the country, and that he wished to see every man paid fairly for what he did, and he would take care that a fair price should be given for sinking and driving in the mines under his management; and if, by extra hard work, they earned good wages he would not "cut" the price at the next survey, unless a change in the ground required it. He encouraged them to work in good earnest, and if they did so they would not need to emigrate to get a living. The 3-ft. stent system he approves of; he will set for a month, and give them a fair chance of earning good wages for fair working. I believe that the mine will pay dividends on the tin returns after a few months under the management of such a good and successful miner as Capt. R. Pryor. I like to work under such reasonable men as him—who will neither pinch the men nor wrong the adventurers. The men only want what is called "fair play."

Redruth, July 15. A MINER.

MINING IN STAFFORDSHIRE—THE ECTON.

SIR,—Although we perused your last impression very attentively for an answer to our letter, subscribed "Residents," we were surprised not to see any reply from Mr. "Miner," Hartington. What are we to suppose from this? That Mr. "Miner's" ideas were somewhat confused at the time of his writing to you; or, that he finds his statements false and utterly goundless? We are of opinion that both our suppositions are correct. Had it been otherwise, why did not Mr. "Miner" reply to our challenge to refute our last letter? In our last communication we led you to understand that we had formed a pretty good idea as to who your correspondent Mr. "Miner" was. We are still of the same opinion, and if (as we said before) we are right in our conjecture, instead of "living in this neighbourhood"—we quote your correspondent's own words—after spending as long a time as he possibly could for the benefit of his health, he left. He then returned with a very plausible statement, that he was going to stay a considerable period at Ecton, for the purpose of surveying certain mining property. Let Mr. "Miner" answer us this question. How was it that he made such a speedy departure? You may think, Mr. Editor, that this may prove rather personal to your correspondent, Mr. "Miner." If he takes it as such, well—if the cap fits, let him, pray let him, wear it.

RESIDENTS.

MINING IN MONTGOMERYSHIRE—No. III.

SIR,—West of Dyliffe, and on the same run of lodes, is Dyfngwm Mine, once very rich, and at present, we were told, looking very well but nothing is doing, there being but one man employed on the mine. That such a valuable property as this should be so neglected is a great pity, as, doubtless, with a contented proprietary and a good Practical as engineer-in-chief, Dyfngwm would soon re-enter the Dividend List.

Still on the same run of lodes, and about a mile further west, is the Cyfartha Mine. At the time of our visit this mine was idle, with the exception of the pumping-wheel, which was at work, keeping out the water. This mine has been opened out in a thoroughly practical manner, and good buildings and substantial machinery erected; in fact, all the preliminary work completed. Several good bunches of ore have been discovered, and everything indicating a prosperous future; but, withall, the shareholders seem inclined to relinquish the prize when it is fairly within their grasp.

Again, West, passing on our way the celebrated Bugailyn Lake, long famed for its fine and large trout, and we arrive at the Bugailyn Mine. Hitherto operations have been on a limited scale, but the mine having recently come into the hands of an enterprising local gentleman, from the indications presented, it would seem that he is determined to make the old hill give up its treasure. A more eligible site for a mine it would be difficult to find. The sett, we were told, is very extensive, and all the natural facilities essential to an economical development are available. The lodes known to traverse the sett are the Dyliffe, Llechweddu, Esgair-Galed, and Cwmbyr. Operations have been commenced upon the Dyliffe lodes, from which some splendid stones of ore have been broken, the gangue of which is such as ensures both riches and permanency in depth. It is intended to drive a cross-cut from the bottom of a deep ravine that will intersect the lode at a great depth; this point attained, there is little doubt as to the result.

On the north side of this ravine is situated the Cwmgwarchan Mine, which, having a long walk before us, we did not visit; but my guide, who had been there recently, tells me that there are several fine piles of lead and copper ore at the mouth of the different levels.

A fatiguing walk through morass and turbury for three miles, and we see facing us in the distance the celebrated Esgair-hir Mine, which we do not reach this time, although intending to visit it at some future day. Our object in coming this far was to see a new mine, called Hyddgen, which has just been started by that enterprising and thoroughly practical miner, Capt. E. Williams, who for over a quarter of a century so ably managed the Dyliffe Mines. Hyddgen is about midway between the latter mine and Esgair-hir, and on the same lodes; from the appearance of the lodes, which have been opened upon in several places, it is quite evident that only a little capital is requisite to bring the mine into a position to rival its rich neighbours.

About two miles north-east from Hyddgen, *en route* to Cwmbyr Mines, we pass a new sett, called Tal-y-bont-drain. Operations had only just been commenced here, but from the appearance of the lode as seen in the costean pits it is very probable that here one day will be a fine mine.

At Cwmbyr Mine, during the last few months, they have been very busy sinking the engine-shaft and doing other necessary work to get the mine in good working order, which they have nearly completed, when, from the prospects in view, and the present able management, there is little doubt but that it will soon become a good and lasting dividend mine. This is the last mine I shall visit this tour; but, all well, I intend shortly taking a ramble through the "Van," or Llanidloes district.—*July* 15.

PEDESTRIAN.

P.S.—I see in last week's Journal that "Cymro" challenges the veracity of my remarks upon the Rhoswydol Mine. Let him read my letter again, now that his ire has cooled a little, and he will find that there is nothing derogatory to the mine therein. What I have said I am prepared to maintain; and that so far, instead of the patent dressing machinery proving a "saviour" to the mine, it has in reality nearly proved its "death." And as he is so fond of "English proverbs," let me remind him of that most excellent one, "Least said is soonest mended."

MONTGOMERYSHIRE MINES.

SIR,—Kindly allow me space in your valuable Journal to congratulate your monosyllabic correspondent, "H. W. N.," on his able letter, which appeared in your last issue. Doubtless it seemed strange to many of your readers that such an epitomiser should devote such a superfluous quantity of words merely to abuse the management of one little mine. Surely there must have been some motive for it. A careful perusal of the letter, and the reader will find that Rhoswydol is praised because "here the most perfect dressing machinery is to be seen;" Cwmbychan petted because the shareholders are advised to discontinue "their pressent mode of dressing," and not to be afraid of fixing a crusher," &c., with, of course, the usual accessories, "as the mine looks healthy;" and Fron Vellan abused because "it is now high time that dressing-floors be constructed," and the manager does not seem in any great hurry to do so. Comment is superfluous; but withall "H. W. N." may rest assured that so soon as orders are received from head-quarters he will be ready to commence at once.

A. HARPER.

Llwyn-y-Ffynnan, Llanbrynmair, July 14.

P.S.—Perhaps in your next "H.W.N." will be more explicit, and inform us how the mine has been "trifled" with, what lack there has been of "energy and management," and what promises have been given and not fulfilled.—A. H.

MINING IN MONTGOMERYSHIRE.

SIR,—I quite agree with the remarks of your correspondent "Cymro:" there can be little or no doubt of the productiveness of the district in which Rhoswyddol is situated—a rich zone, in which Dyliffe, Dyfngwm, and other mines are now being profitably worked—and further westward is Cwm-byr, now turning out well. Between this mine and Rhoswyddol a large extent of ground, comprising Cwm Tudor, Glasllyn, and Moelfadian Mines, is being largely opened up, and at the two latter mines fine ore is now to be seen at surface,

from very shallow workings, and I have no doubt when the lode is found in the low basin of ground that a rich deposit of ore will be laid open. It would be a pity if such were not the case, as these mines possess the finest water-power in the Principality. Further west, again, a large tract of land called Hyddgen is being tried, and fine courses of ore laid open; and further west still is the old Esgair-hir Mine, now opening out richer than ever. Of course it is not to be supposed these mines are all on the same lode, but all are in the same rich zone of lead-bearing strata, and cannot fail of success if spiritedly worked, and there is little doubt now that Dyliffe and Esgair-hir are turning out so well that great attention will be attracted to this district. "ICH DIEN."

LADYWELL MINE, SHROPSHIRE.

SIR,—I notice that this mine is on the point of becoming the rich prize which has been foretold by its most astute patrons and judges. It consists of 12,000 shares, with 2*l.* 10*s.* paid. A large sum in cash now stand to its credit. It is introduced under the same auspices as Roman Gravels Mine, which immediately adjoins, and which it is about to rival. Present price, 70*s.* per share. Roman Gravels has, however, 7*l.* 10*s.* paid, making the purchasing price exactly three times the amount; but it has half a million sterling laid open in reserves in the short space of two years or less. The offices are at 20, St. Helen's place, Bishopsgate, E.C., and the direction is considered highly satisfactory. The indications, as predicted, are in every way proving precisely identical with those at Roman Gravels. The area of the mine is ¾ mile long by ¾ mile wide, on the course of the Roman lodes. On May 17 Capt. Waters writes—"I never saw a lode (speaking of the 16 fm. level north) more like the Roman vein than this in my life." Again, on May 22, he says—"I consider this (the 16, driving north, on main lode) to be a vein similar in character to the great Roman lode, at the same depth from surface." Magnificent rocks of lead ore are being sent to surface in large quantities, depth in some degree, being only requisite to show this mine as valuable a prize as its sister adjacent. The 16, by last report (north of engine-shaft), is worth 35*l.* per fathom, with increasingly favourable appearances; this is on the main lode. The 16, south of engine-shaft, has a good course of ore in easy ground, and lead (weighing 2 or 3 cwts.) comes out in loose lumps—in fact, any novice may judge for himself that an embryo Roman Gravels Mine lies *perdue* in this fortunate property. The 160, north of the shaft, looks better than at any previous time.

NEMO.

MR. N. ENNOR—PRACTICAL MINING.

SIR,—I am happy to say I am recovering from my severe fall. Having pitched upon my head I have not quite recovered my eyesight, and am not yet able to reply to all those writing in the Journal; however, I only reply to those who put their names, not to others: they are only men who are shielded with a coat of mail; they make their attacks like highwaymen upon those they expect to find unarmed to meet them, they never appear in open day, the acts through the lives of nine tenths of them will not bear sifting by daylight. It is only a waste of time to comment upon a bad thing, I let them pass. I know the class well, they are to be seen in every town at the corners watching for their man, they follow him to the inn, and get what they can from him, and the first opportunity they have they put on the coat of mail on a dark night and shoot at him. Many of this class call themselves mine captains to strangers, and they appear as such; they are ever ready to tell untruthful tales to get drink or money, and, I am sorry to say, too many men not overloaded with brains listen to them, and at times they get up a mine or mines, many of which never showed a chance to pay a cent. in the pound for the money spent. To confirm this, let the reader look down your call-paying list, and see the amount of calls made of even 20,000*l.*, 40,000*l.*, 60,000*l.*, or 100,000*l.* for a mine; it is frightful to look it through. Having seen most of the mines myself, I say nine-tenths of them should never have had 5000*l.* spent upon them: no honest or well trained captain would have spent such sums of money after he knew it was a bad thing. I have hinted before that a man who even takes a share in a mine should first look at the pedigree of the captain, and he who signs the report. The best thing I know for those inclined to speculate on the chances of mining is to make a choice of a young captain, or one who has actually found paying mines. Never take shares in mines with men who have spent their 50,000*l.*, and even 100,000*l.*, on an old worthless mine; they well knew the mine would never pay, but they were lining their own purses, they cared not two straws as to what the mine did, they made no further use of their brains than to get up a report by the time the general meeting was held, to show the good points they had to come off. This is done to get a large call made, when many of the mines never had a good point in them.

Widebridge, Cornwall, July 16. N. ENNOR.

[For remainder of Original Correspondence see to-day's Journal.]

The Prize Essay—Practical Mining.

No. XII.

SECOND ESSAY—PART VI.

ORE DRESSING.

Ore dressing is a science in itself, and should be controlled by men competent to judge what they are doing, but in many instances the reverse is the case. No amount of money is spared in obtaining good machinery and competent men to raise the ores, but the preparing it for market is often left to men whose practical experience is very limited, hence the lamentable waste we find going on around us call for an immediate remedy. The ore dresser should be competent to know the best means of reducing the peculiar ore he has to deal with, and to what state of fineness it is desirable to reduce it with the most economical and approved appliances. Three propositions may be observed:—First: The selection of minerals cannot be arrived at to perfection owing to the irregular cleavage or fracture of the stone—for instance, if flaky, a greater surface will be exposed to the action of the water, and this will, in some cases, overcome its specific gravity, and will not find its proper place in the settlement; the upper surface will be strewn with shale or flakey particles, although containing mineral of great density.—Second: Ores reduced to too great fineness is a source of very great loss. It will be separated with difficulty and at a great outlay. It is most desirable not to stamp lower than is requisite to separate the ore from the matrix, and to effect this grates of a size sufficiently large to pass the granular ore should be used first, and afterwards the roughs passed through a finer grate. We shall then find the tin in the head of the strips, and much saving of metal will ensue.—Third: The best machinery is that which reduces to a proper size, classified by trommels, having a mesh suitable to the kind of ore under treatment, which must be determined by experience with the peculiarity of the stuff, doing a complete and distinct separation of grains of the same density, the stuff must always be kept in suspension after coming from the pulveriser; if let to rest the putting it in suspension again adds to expense and loss of metalliferous mineral. The above principles may all be carried out by the use of machinery herein described, but the ore dresser must be a responsible agent, possessing care, skill, and observation, and having a knowledge of most machines and the kind of ore they are working on, for it is often in this department that the mine is either made payable or otherwise. The same appliances adopted at one mine and found to be very successful, when applied to ores of a different character at another, may not be an economical machine, but the reverse. And so with the ore dresser; he may have sufficient knowledge to dress ores he has had long experience with, but put to manipulate on other stuff an assay of his tailings may not be satisfactory. This should be done at regular intervals, and carefully recorded at every mine, as it would cause more care to be taken in the dressing, and instead of immense quantities running away to the sea, we should (as we ought), now we possess such saving machinery, find the tailings worthless. I do not mean to assert that the English ore dresser is behind his foreign brethren in this art, but that there is great improvements to be made. In Cornwall they call it a good mineral if it will yield 35 to 40 lbs. of black tin to the ton of stuff with the present wasteful appliances, the same stuff treated by improved machinery and a scientific system of classification direct from the stamps carried out the gain would be very great. The nature of the dressing operations or description of machinery to be used must always depend on the nature of the stuff to be treated, its cleavage, crystalline structure, and specific gravity.

TROMMELLS.

The trommells are for collecting the stuff together in various sizes, after which it is separated by one or other of the many ore-separating machines, such as jigs, buddles, cases and trunks, sleeping-tables, round frames, shaking-tables, &c. Now, a primary condition in the best dressing-floors is a good classification, suitable to the peculiarity of the mineral to be treated, and when this is obtained we may look for speed in the separation. But in laying down trommels and other classifying and separating apparatus, it must also be borne in mind that there is a limit to this subdivision of stuff. On the Continent it is often carried so far as to entail a loss in its working. As I have said, it is of the greatest importance that all ores should be as nearly as possible of the same size, otherwise, in concentrating by washing, they will not assume their proper position. According to their specific gravity, the greater surface of the lighter particles will compensate for the density of others—as, for instance, thin scales of sulphide of lead and malachite will float on the surface of the water, notwithstanding their density. The difficulty of concentrating the ore will increase with its fineness, and the greatest aim should be to secure the metalliferous grains in their normal state. The use of trommels cannot be too highly recommended—the clearing trommel, which deprives the veinstuff of earthy or clayey matter; separating trommels, which divide coarse and fine-grained stuff for sizing trommels; sizing trommels, which prepare stuff for jiggers and buddles; draining trommells, which deprive sand of the water it contains. Those in use at Devon Consols, and a few other English mines, are too well known to need any detailed description. They may consist of one long steel, iron, or zinc conical perforated tube, divided into sections, or in a series of tubes, with perforations of different meshes, suitable to the class of stuff under treatment, worked by one continuous shaft, and all self-acting, or automatic, in every particular, and so lessen labour on the dressing-floors. The wash-trommels are about 4 ft. in diameter by 9 ft. long, fixed at an angle of 1° per foot, making 14 revolutions per minute, using 25 gallons of water per minute, and will get through about 60 tons of stuff in a day of 10 hours.

JIGGING.

There are numerous machines devised for this purpose; we have the Petherick, Trumball, and Morton jigs, which are plungers, but we shall find some adhering to the elastic diaphragms; then there are also the continuously working jigs, self-discharging jigs, and numerous other inventions, German, French, and American; Rittinger's self-acting jig, with grates, inclined nearly 8°, the front partition of which is exceedingly low, and at its base is a slit to carry off the rich ore into a box below, whilst the tailings flow over the front portion, which is a segment of a circle, and so arranged as to admit of the opening or closing of the slit beneath, as the case may require. Huet and Geyler's self-acting jig have automatic perforated sheet-iron scrapers to assist the water in removing the tailings, and is said to work with little water. Krom's air-jig is a most ingenious machine, and no doubt would be employed in countries where a scarcity of water is felt, but for its slowness in turning out the stuff; Hooper's is also an air-jig, and gets through more work than Krom's, but the waste in dust precludes its adaptation. The Union Ore concentrator, I believe, has only been tried by experiment, or to a limited extent; this invention claims to collect and save all the dust, and uses a cotton net, or cloth, in lieu of perforated metal or wire gauze. Continuous fine sand jigging machines might be advantageously employed; on the Continent those have superseded the whole of the shaking tables, round buddles, &c.; they get through some 10 cubic metres of stuff in a day, low in price, and require little power to work them. There are also other devices for separation, such as ores falling through a column of water, which are but modifications of the jig. The whole success of such apparatus depends on the sizing of the material, and in Huet and Geyler's separator the velocity of the bottom cylinder or receiver must be timed very exact, the metalliferous matter must have undergone a very careful sizing, the sizes and specific gravity of the ores being obtained by actual measurement and experiments; in those particulars lie the merit of such machinery. There are also settling tubs, sorting boxes, slime separators, and shaking frames, or tables, &c. Now, with all these appliances, which, no doubt, work well on the Continent, I venture to assert that they do not supersede our best machinery at home; and in those dressing establishments where a fine and minute classification and separation is carried out before buddling, and clean water in use for dressing, we do not find much waste going on.

I have enumerated many machines, but the following may be recommended. For reasons already stated, the orey matters have been trommelled, or sized, and the most efficient separating machine is Petherick's plunger-jig, with the Kley-slide motion, as manufactured by Harvey and Co.; this apparatus is the basis of all other jigging machines, and is employed in most of the English and foreign mines. It consists of a plunger, worked in a cistern of water by a beam attached to a shafting supplied with spur-gear. The plunger being forced down causes the water in the cistern to rise through the sieves, and keeps it in a state of continuous agitation; by this means the stuff which has been laid on the sieves is kept in suspension, the lighter is forced to the top, and the heavier sinks to the bottom; the plunger works 60 revolutions per minute for about 10 minutes, is then allowed to rest for a moment, the light or top stuff is skimmed off the sieves and thrown aside, the bottom layer or ore is collected, and the operation repeated; a portion of the top may in some cases be re-worked. This is a very simple machine, and the work is performed with great rapidity. The sieves are mostly copper-bottomed, perforated with holes suitable to the stuff under treatment, usually about 1-16th in. diameter.

Hunt's patent ore separator must also be recommended as a useful and efficient machine; it will work off 40 tons of low quality ore in 10 hours, and can be worked with any power equal to that of a man, and with little water compared to the quantities used by other machines. The ore is supplied in a hopper with the water, which causes it to run into the sieve; a gate is attached to the sieve to regulate the feed; the bottom of the sieve is made of copper perforated with conical holes about 1-16th inch on the under side, and very fine on the top, regulated according to the nature of the stuff under treatment. A plunger is provided to force a constant and steady flow through the sieve, by which means the stuff is always in suspension, the sieve is divided by low partitions, and ores of different specific gravities are found properly separated in their respective compartments. Even precious stones, which are frequently found with alluvial gold, may be separated and saved, so delicate is the action of the machine. It was employed successfully in washing the waste heaps left from the old workings at Pont Pean, Brittany, and numbers are used in the mines of Cornwall.

BUDDLES.

Most of the modern patents are only attempts at improvements on well-known contrivances tried many years since, and royalty need not be paid for working those inventions when we have Rittinger's buddles, continuous round buddles, concave buddles, side-blow shaking tables, &c., with many jigging machines, trommels, &c. The concave or slime buddle is a very useful machine, and in skilled hands is capable of doing good work. The ore is concentrated on the floor at the periphery, and distributed through pipes or V-shaped launders, taking the ore from the central trough.

The convex, or outward flow, being the ordinary round Cornish buddle, has its advantages, and still hold its own in most of our English mines. It is built about 24 ft. in diameter, and usually has a 7-ft. run from cone to the circumference; the incline must be adapted to the character of the work to be treated; the cone or distributer is about 10 ft. diameter, and much more acute. This buddle requires 1½ in. pipe to supply it with clean water; the brushes are connected to the pipes attached to the cone pan, and make three to four revolutions per minute. The ore having the greatest specific gravity settles nearest the distributer, and any ore escaping is distributed over a large area, and passes on through a slower motion as it arrives at the periphery, therefore having time to settle. This adaptation of buddle is best understood, easy of construction, lighter, and less expensive than most others.

Borlase's buddle is an inward flow concave or funnel buddle, receives its ore on a central revolving pan, from which it is carried through pipes to the circumference, and equally and regularly distributed from the outside to the centre, which is 3 feet in diameter, perforated with holes for carrying away the waste and water. The buddle is 17 feet diameter, depth 14 in., with an incline of 1½ in. in 1 foot, it will require a pipe 1½ in. diameter to convey clean water to the buddle. The advantages claimed are the following—the tin having a larger surface for its deposit at the distributing point, catches more first tin, and the transit of tailings is more convenient, but perhaps this is compensated for by the loss of all the tin that passes the head, for being brought into a smaller surface, which means a greater velocity and quicker water, it has not time to deposit or settle. Rittinger's concave rotatory frame is an obtuse wooden funnel 16 feet diameter, the surface is divided by strips of wood ⅔ high into 32 segments, each of which is terminated by a square wrought-iron shoot, through which the substance is washed and passed in parallel ring launders below; eleven distributers are fixed above it, and discharge their contents at the periphery of the funnel; the ores are passed into a box and puddled by a rotating paddle; the drainings from the table are saved in the ring launders, which are so adjusted as to receive the ores according to their specific gravity.

Zenner's rotating buddle is a conical wooden platform, having a rotatory motion; the stuff is first worked up in a box by a revolving paddle, and passed through grates to a perforated V-shaped ring launder, or distributer. There are also other curved launders for the supply of water, which is distributed in small jets; the brushes are fixed to the axis of the machine and extend to the periphery of the buddle. The stuff will reach the edge of the machine at different periods, according to its density, and a divided ring launder is provided and fixed under in such order as to catch the various grades of stuff as the machine revolves, each division being provided with its own discharge pipe.

Wm. Rule, of Dolcoath Mine, patented a concave buddle, and dispensed with the brushes, having the surface of the table roughened. I do not see any improvement in this over the ordinary concave buddle, and, on the other hand, believe it will use more water than the brushes were in use; and, as I have noticed before, ten times as much water is already being used in our dressing operations.

R. H. Williams' buddle has a conical floor of Roman cement, with a pitch of about 10½ in., when the ores are stamped through a 9-hole grate, and is calculated from the centre to the periphery of the buddle on a 6-ft. run; it is provided with a revolving tube to regulate the supply of ore, which falls into a cup in the centre of the buddle, and is a self-regulating distributer of the ore over the conical floor. There seems to be a little economy of water in this arrangement, and if not using more than is necessary to separate the ore less is washed away with the tailings. This machine is of cheap construction, and not liable to decay.

J. Boyns, of Botallack, St. Just, has invented ore-dressing machinery. The greatest merit in this arrangement is the sizing or separation effected before submitting it to the other washing appliances necessary to separate the metal from its gangue. He uses a compound buddle, Chilian mill, and a muller-trough, which has a to-and-fro motion given it by a crank and connecting rod. Then there are Mr. Arundell's modifications of cast-iron rotating conical tables, other rotatory, convex, and concave buddles, funnel frames, Brooks' buddle, as used at Bendigo; Lewis's, as employed at Clunes, Ballarat; and Munday's, as in use on several claims in Victoria. Huet and Geyler exhibited both concave and convex buddles at the Paris Exposition, constructed entirely of cast-iron, and it is said to complete the washing in one operation; as also does Borlase's ore-dressing machine, which is an inclined circular rotating wooden frame 24 feet in diameter and 6 feet in breadth. The stuff is brought in by the stamps direct at the upper part of the inclined frame, which revolves once in three minutes; the light stuff is carried away immediately to the inside of the ring; and deposited in ring launders beneath; the ore is carried around and subject to a carefully regulated stream of water, by which it is washed before it arrives at the lower part of the frame, when it is washed off into receivers provided for this purpose. This is a continuous working machine, and takes the stuff direct from the stamps and finishing it in one operation. My recommendation which should not be overlooked; any machine which dispenses with labour and is capable of saving even 1 lb. per ton of stuff more than the usual appliances is worthy of a trial. With tin at the present high value, by employing such machinery as I have described great saving would be effected, and encouragement would be given to the use or trial of any new adaptation of dressing machinery purporting to be less costly, more simple, requiring less labour, less power, and more expeditious, which are the advantages claimed for Borlase's ore-dressing machine. It is a difficult matter to describe the best mining machinery, as all of the above machines have many good points, and one may be better for treatment of some ores than another. Suffice it to say that the trommels described—Petherick's jig, Hunt's separator, Cornish, Borlase's, Zenner buddle, and, though last not least, Borlase's ore-dressing machine—do good work, and may be classed as the best mining machinery.

[To be continued in next week's Mining Journal.]

NEW COAL-CUTTING MACHINERY.

Amongst the most important developments of mechanical science at the present time are those which tend to increase the facilities for the output of coal. The latest invention in this direction which deserves our notice is the new apparatus brought out by Messrs. Hurd and Simpson, in which the inventors have aimed to produce a machine which shall be adaptable to almost any workable seam of coal. The machines, which only require a space of 3 ft. from the props to the face of the coal, are constructed to work seams from 18 in. thick and upwards, and are the result of ten years' study on the part of Mr. Hurd. The machinery consists in the use of a cutting-wheel armed with cutters, which are made of plain steel, square set sideways above and below for the clearance of disc, and adjustable radially accordingly to the quantity of the coal to be cut. The cutters, which are put into or taken out of cut by a swivel nut or screw acting on the lever in which the cutters revolve, may be driven by an ordinary bevel-pinion or by a double pinion with bevel teeth and a recess to embrace the inner centre ring, and the pressure resisted by conical anti-friction bowls, thus dispensing with guides and slides. The machine is supported on a bogey-frame, which is mounted on carrier wheels to the footstep of the shaft, the fulcrum on which swivels the radial arm, to which is connected the cutting wheel, but the frame can be swivelled round independent of the radial arm. Plough-shoes, which can be fixed on either side of the machine, are provided to prevent or remove the debris from the cutters lodging on the rails in front of the wheels. The special point of the invention, however, consists in the eccentric action of the cutters and the differential lever for adjusting the machine to the inequalities of the face of the coal. By placing the stocks eccentric to the fulcrum on which the cutters revolve, the cutting hold is secured, and a considerable saving is effected in the hauling power required. By the combination of a differential lever with a leading bowl and the hauling-chain, a self-acting adjustment is secured for the inequalities of the coal, which enables the machine to work on any ordinary tramway, and where there is a tolerably straight face even without a tramway. The machine is also self-acting in adjusting itself in its forward motion to the variable hardness of the material being cut. Another important feature connected with the machinery is the introduction of a retort for heating the compressed air by which it is worked. The retort consists of an outer chamber containing a perforated crucible charged with charcoal. When the fuel is ignited the retort is taken to the machine and connected to the branch pipe, the compressed air tube is then coupled to the pipe and the air turned on. The air, after pasing the valve, enters the retort through the perforations in its end, the instantaneous expansion of the air closes the valve, and the air in its heated condition is then conveyed to the engine to be driven. In conjunction with these machines Messrs. Hurd and Simpson have brought out an apparatus for heaving up the bottoms of the coal after being undercut when the top portion has been removed. This consists of a double wedge-shaped shovel, which is forced by a screw or ratchet, or by air or water-power. The above coal-cutting machines are for straight work only, but Messrs. Hurd and Simpson have also machinery for tunnelling or driving headings. This machine, however, only differs from the previous ones by the same inventor that the cutting-wheel, instead of being supported on a screw pillar, is now supported on vertical slides, which can be swivelled entirely round either when the machine is at work or at rest.

WASTE PRODUCTS.—Mr. CHARLES BOUNDY, metal broker, Birmingham, has patented an invention, according to which the waste product material, consisting principally either of hard spelter, old zinc, new zinc cuttings or zinc riddlings from galvanisers' ashes, is placed upon the top of an incline, forming the bed of a muffle or nearly closed chamber, and heated so as to sweat it out of it the zinc, which zinc runs down the said incline bed, carrying with it any lead which may be contained in the material, and also solid particles of foreign matters. The liquid metal collects in the first of a set of receivers situated at the bottom of the bed. In the first receiver a large portion of the solid matter carried with the metals falls to the bottom. The metal in this receiver is removed from time to time, the upper part being poured back and the lower part being cast into ingots and treated again. As the first receiver becomes filled the zinc overflows into the next receiver, and so on, where a spontaneous separation of the kind described takes place. The separated and purified zinc finally collects in a large pot or reservoir, and may be cast into ingots or otherwise. Before treating zinc riddlings from galvanisers' ashes by the process described they undergo a preliminary treatment for the purpose of utilising the sal-ammoniac and oxide of zinc contained in the said ashes.

Meetings of Public Companies.

DIAMOND ROCK-BORING COMPANY.

An extraordinary general meeting of shareholders was held at the company's offices, Westminster Chambers, Victoria-street, on Wednesday,

Mr. JOHN PENDER, M.P., in the chair.

Mr. JAMES H. SMITH (the secretary) read the notice convening the meeting and the minutes of the preceding one, which were confirmed.

The CHAIRMAN expressed regret the meeting was not more numerously attended, and could only account for it by assuming that all were satisfied with the rate of dividend declared. The meeting was almost an informal one, for the directors might have declared the dividend without calling the shareholders together, but as he stated at the statutory meeting that this meeting would be called, they had fulfilled the engagement. They did not propose to put before them the accounts now, but at the end of the year they would submit a full statement showing the progress made. Indeed, at the present time, from the nature of the business in which the company was engaged, and the many first contracts half executed, it would have been inconvenient to draw up an accurate balance-sheet, but Messrs. Whittle, Dever, and Co., the auditors of the company, have recommended an interim dividend at the rate of 10 per cent. per annum, which leaves a good surplus profit to be carried forward. They have prepared them an approximate statement of profit and loss, showing that they had realised 4558*l.* profit, out of which it was quite safe to declare a dividend of 10 per cent., which would absorb 2424*l.*, leaving 1861*l.* for future disposal. From this statement it was evident that they were making very satisfactory progress, as they were paying a fair interest, and at the same time carrying forward a good balance. In connection with the payment of the dividend he might make a few words of remark. He had stated at the last meeting that when the company was formed the whole of the shares had not been taken up, but in the past six months the whole had been subscribed for. In making out the dividend warrants, therefore, the amount had been calculated from the date at which the payment was made. He thought it would be agreed that this was a fair arrangement. The progress of the company had been very satisfactory during the past six months, and at the present moment they had 25 prospecting machines at work, against 22 at the date of the last meeting, and 11 others were in course of construction. They had also concluded an arrangement for working the patents in Austria, under which they were to receive a considerable sum in cash, and one-third of all profits realised beyond 5 per cent. He would add that more importance was attached to the latter condition than to a cash payment; so that if the Austrian company got plenty of employment, as they no doubt would, they would earn large profits, in which this company would participate. Similar arrangements were also going on in connection with the development of the patents in Saxony, Australia, Belgium, and France. He might mention that the cash received from these sources it was the present intention to apply to the reduction of the amount paid for the goodwill of the business, that was, they would write off the amount in the capital account. With regard to the patent right shares, they would not come in for profits until the holders of the other shares had received 10 per cent. for five years, or until 50 per cent. of the subscribed capital had been returned, providing the 50 per cent. were received within five years. He had already stated that their business was progressing satisfactorily, and he might add that they had that day signed the contract with the Tees Conservancy Commissioners, by which they would get 17,000*l.*, which Major Beaumont, the managing director, was confident would leave them a fair profit, and would also be a very satisfactory contract for the company by affording them an opportunity of showing others what could be done with a machine in removing sub-aqueous rocks. He had stated at the last meeting that Mr. Brogden and himself had taken great interest in the company, and he was glad to say that he had received a very gratifying letter that morning from the company's agent with reference to work which was being done for the Mwyndy Coal and Iron Company, in which he says:—

"DEEP BORE-HOLE.—You will be pleased to hear of our great success in the deep bore-hole, having thoroughly proving from 20 to 30 feet deep of iron ore and ochre nearly all the way, and the latter article is I hear the most valuable."

The latter was the more satisfactory, as the results mentioned were obtained with one of the earlier constructed machines, which was not so perfect as those since made. At the Tredegar heading, where the company were driving a tunnel, a satisfactory arrangement had been entered into; they were getting a minimum fixed price for performing the work, and this price was increased according to the speed attained—the greater the speed the more they received for the work, the importance of getting the work done as quickly as possible being so great that the parties were quite willing to offer the company those terms; this would prove a valuable source of profit to the company. They had, further, entered into a contract with the Mayor of Lincoln, as representing certain landowners, to bore down a bore 1,500 ft., and the amount receivable in cash would be a good profit, in addition to which the company secured important perspective advantages. He was not aware that there were further observations for him to make, and as they had no report or accounts to submit he had merely to move that the dividend of 10 per cent. be paid, but before the motion was put he would be glad to answer any questions which might suggest themselves to the meeting.

The SECRETARY, in reply to a shareholder, stated that seven of the machines were working at a fixed royalty by Mr. Brogden, and that one machine was working in Prussia on royalty; and two in Sweden, two in Prussia, and sixteen in England on contract.

Dr. LYON PLAYFAIR, C.B., M.P., in seconding the resolution for the payment of the dividend, remarked that the working of the foreign machines would also yield them a good profit, five having already gone abroad. There was, he conceived, in reply to a question, a patent for the diamond crown in England, which was originally a French invention, but had been acquired by Major Beaumont, and there was also Major Beaumont's own invention of the machinery for working the crown. All were in the possession of the company.

Mr. FLATEY observed that at the last meeting it was stated that the machinery was liable to damage; he would, therefore, like to hear from the Chairman whether such was the fact.

The CHAIRMAN said that the machinery was certainly not liable to damage, and that the wear and tear of the diamond crown depended upon the nature of the rock they had to pass through. In some cases the wear was necessarily more than in others, but that did not affect them, because they charged every expense on the contract—they kept the machinery in repair out of the contract, and made ample allowance for wear and tear. It was only the difference after every expense had been charged that they regarded as profit. In their accounts, moreover, they wrote off 20 per cent. for depreciation, so that the allowance for contingencies was very ample.

Major BOLTON stated, in reply to a shareholder, that the nature of work done by the Diamond Drill, and the speed at which it was accomplished, was such that they had no serious competition from any other boring machine. A bore-hole had been commenced and carried to a depth of about 300 feet, by Messrs. Mather and Platt, Manchester, and then given up; it was undertaken by this company, and satisfactorily completed to a depth of 600 feet, when the coal was proved. The certificate with reference to this boring was as follows:—

"*Bunney Colliery, near Nottingham, May* 1.—In reply to your request, I have pleasure in certifying as follows:—The lode you have put down on Lord Middleton's estate, at Wollaton, for the purpose of proving the lower hard and soft coals for Messrs. D. New and Co., of Nottingham, was in every way successful. Although you had an unusual amount of difficulties to contend with, the cores brought up from the lower bed of coal were perfect, enabling us to judge of its quality in a way that the ordinary method could not have done.—(Per pro D. New and Co.) HENRY DAVIS, Mining Engineer.

The payment of the dividend was then unanimously agreed to.

A large core of conglomerate, 18 in. long and 5½ in. wide, brought up by the diamond drill from the bottom of a bore-hole 740 ft. deep, was exhibited on the table, and excited much interest amongst the shareholders.

The CHAIRMAN thought they might now proceed with the business of the second extraordinary meeting, the object of which was to consider a special resolution for changing Art. 160 as it stood at present, and which provided that dividends not claimed within three years should be forfeited, and insert another giving the company power, in certain cases, to accept fully-paid shares in lieu thereof. It was, perhaps, necessary to give two words of explanation of the article which they proposed to insert. They might be placed in the position of contractors, and in that case it would be almost imperative that they should take shares. Again, in the case of the sale of the patent rights in Austria, the arrangement included a provision that this company should receive one-third of all profits realised beyond 5 per cent., and it would be very convenient if this company had the power to take fully paid shares in the Austrian company, to secure that one-third without the necessity of investigating the accounts: it would remove all difficulty of determining the proportion of profit to which this company was entitled, and the directors felt justified by making a bargain to take shares the interest of the company would be best suited.

Dr. PLAYFAIR added that the present Art. 160 was proposed to be expunged to meet the views of the Stock Exchange.

Mr. EWING, M.P., was glad to hear the flourishing account which the Chairman had given of the position and prospects of the company, and believed that they were connected with a company which would be of advantage to every shareholder. The letter from Wales which the Chairman had read showed the advantage of the machinery, for without it, perhaps, the discovery referred to would not have been made for years; but for these very reasons he had a great objection to the resolution, which he feared might lessen the solidity of the company. He suggested that the acceptance of shares should be limited to one-third the amount receivable in cash.

In the course of the conversation which followed it was pointed out that such a limit would be objectionable, and the Austrian case was referred to as an instance. By adopting the suggestion the company could only accept 1000*l.* worth of shares, whilst by the arrangement entered into they would be entitled (assuming the Austrian Company to have a capital of 60,000*l.*) to 20,000*l.* in order to secure this company their one-third of profits, and it was ultimately resolved that the article should read:—"Art 160. The board may, in its discretion, accept in lieu of cash fully paid up shares, to which no liability shall attach, in any company, society or corporation with which the board may enter into any contracts or agreements, in part payment of the consideration money for such contracts or agreements, and the company may become registered as the owner of such fully paid-up shares, and may hold, sell, dispose of, or otherwise deal with the same as the board may think fit." The usual complimentary vote of thanks to the Chairman and directors terminated the proceedings.

ANGLO-AUSTRALIAN GOLD MINING COMPANY.

A meeting of shareholders was held at the offices, Austinfriars, on Wednesday, to obtain from Mr. Kitto information as to the position and prospects of the company,—Mr. WINGROVE in the chair.

The notice convening the meeting was read.

The CHAIRMAN said, from a conversation he had had with Mr. Kitto, it appeared that the Sir Roderick Murchison Mine was, in Mr. Kitto's judgment, very promising, and held out favourable prospects of proving a success, although he (the Chairman) feared the directors would have to come to the shareholders for more capital, either by the issue of the unappropriated shares or in some other way. He did not, however, think there would be any difficulty upon that point. At the date of the last meeting Mr. Lamb had in hand 700*l.*, which, if he had confined operations to the main workings, would have enabled him to sink the eastern shaft to the 320 ft. level. Mr. Lamb had thought fit, however, to go on with other works, as well as sink the shaft. Mr. Lamb may have excellent reasons for doing so. It appeared that he had sunk two shafts—one, the eastern, to a depth of 306 feet—which would intersect a body of stone which Mr. Lamb thinks likely to be payable. There was also a prospecting shaft to the south, which Mr. Lamb had also going on, with the view of striking a smaller leader of gold. But the eastern shaft was being sunk on the main reef, and at the date of the last advices had reached a depth of 306 ft., but it was necessary to reach a depth of 320 ft. before a plat was made to reach the reef. He had had an opportunity of talking with Mr. Kitto, and there appeared certain circumstances connected with the mine with which he (the Chairman) was not previously acquainted, and which he thought were of very great interest. Mr. Kitto had informed him that there were 40 or 50 shafts which been sunk at different times in former years—three had been sunk to a depth below which the former workers could not go on account of water. From statistical evidence the returns of gold from these shafts had amounted to 150,000*l.*

Mr. KITTO said these figures had been obtained from the storekeepers' and miners' accounts, and it was unreasonable to suppose but that there was something very good at greater depths. It has been his experience in Australian mining that reefs become of increased value in depth. Another evidence of the value of the company's property was that another company, formed of local capitalists, had commenced sinking immediately to the south, and at a depth equivalent to 320 feet in the Murchison Mine a considerable mass of stone was being worked, sufficient to yield profitable returns, and sufficiently encouraging to raise additional capital to erect stamps and batteries, having paid regular monthly dividends during the past year. There was no doubt they had sunk the shaft further from the reef than they would have done had they been better acquainted with the nature of the underlay, and that the western shaft had also been sunk to too great a distance, which has probably retarded their operations for about 12 months. The prospects of the mine, as far as he was able to judge, and he was assured, were exceedingly promising if they only carried out the work now in progress—in fact, they could not have better prospects in any mine.

The CHAIRMAN said that opinion was corroborated by other evidence, which he (the Chairman) had taken the trouble to obtain from sources not in any way connected with the company.

Mr. KITTO, in reply to questions, stated that he calculated the 320 ft. had been reached by this time, and that the plat was now being cut. In the adjoining mine they were working on the main easterly lode, the main lode not having been struck; further south there was the Duke of Cornwall (formerly the property of the Australian United Company), which was now taking its place as one of the most promising and richest mines in the colony. It was true it had taken longer to develope the Murchison Mine than was expected, but that should be no discouragement, seeing that the neighbouring mines were often re-organised, and their capital increased—indeed, the adjoining mine had increased their capital for the purpose of erecting 20 heads of stamps. If the Anglo-Australian Company had been incorporated in the colony its shares would at the present time be saleable at par. All the adjoining mines had come upon ore in depth. He calculated it would take the remainder of the capital and about 18 months in time to bring the mine into a dividend-paying condition. It was now being proved beyond doubt that the richest mines were the deepest—which was quite contrary to the theory hitherto propounded by geologists.

A vote of thanks to the Chairman and directors closed the proceedings.

AUSTRALIAN UNITED GOLD MINING COMPANY.

A meeting of shareholders was held at the company's offices, Austinfriars, on Wednesday, to afford Mr. Kitto an opportunity of giving information regarding the position and prospects of the company in the colony, Mr. WINGROVE in the chair.

The LONDON MANAGER read the notice convening the meeting.

The CHAIRMAN said that, in order to make the shareholders *au courant* with the company's position since the last annual general meeting, it was necessary to state that on April 23 Mr. Lamb advised the directors by "wire" that he required 1000*l.*; that amount was paid into the company's bankers, but as the money had been subscribed upon the condition that the advance should form the first charge upon the property, the bank objected to receive the instalment of their indebtedness. The directors then asked Mr. Lamb, by telegram, the total amount of the debts, to which a reply was received that the liabilities were 2600*l.* As he had said, 2500*l.* had been subscribed, upon the condition that it should form a first mortgage, to which the bank objected, but seemed perfectly satisfied with the value of the property upon which they had made the advance. Within the last hour this cablegram had arrived:—"Bank won't pay wages. Unless a credit wired by the branch manager before Saturday we must stop finally. Mr. Kitto was present, and would explain the position of the mine. It might be possible that some shareholders would subscribe 5000*l.*, which would enable the directors to pay off the indebtedness to the bank, and leave sufficient funds to make ample trial of the present discoveries; or, if the bank proceeds to a sale of the property, possibly a few of the proprietors might raise a sum of money, and order Mr. Lamb to bid for an amount which they might deem advisable. The discoveries made in the Central Mine had induced local capitalists to subscribe 30,000*l.* to sink a shaft immediately adjoining their boundary, and he thought it more than probable if the property should be put up for sale there would be competition for it. Unless they could raise more money than they had at present got the directors were not prepared to send it out, unless it formed the first mortgage, or they had absolute possession of the property.

Mr. KITTO said he wished to meet the shareholders upon the first possible opportunity after his arrival in England. He wished to inform them that some three or four days before he left the colony he went through the whole of the underground workings of the Central Mine, when the reserves which he had previously reported on were there; and why the lode had since been reported as being worked out, and why it was abandoned, he had no evidence before him to show. It seemed to him that the ground had been allowed to go together, and that the gold opened up had been left by Mr. Lamb and his agent. He calculated that the reserves "blocked out" were worth from 15,000*l.* to 20,000*l.*, the ground only required proper attention to keep it open, and that the ground had not been kept open was evidenced by the fact that the new discovery had not been worked. Why it was said that the lode had been worked out and abandoned he did not understand. He knew the gold was there. Probably there had been a burst of water which had brought the whole of the ground about them.

Mr. DAUKES asked the length of the "blocks?"——Mr. KITTO replied that they were from 400 to 500 feet, and even now, if the ground had been abandoned, it could be worked immediately it solidified. Sometimes the "blocks" ran together, when it was only a question of time for them to solidify, to enable the gold to be extracted.

Mr. DAUKES asked if there was not a level being driven considerably below the rich gutter?——Mr. KITTO said that they were cutting down the level which would drain the eastern gutter.

Mr. J. ROBERTS asked Mr. Kitto whether the accident would have taken place if he had remained at the mine?——Mr. KITTO said that as he did not know the circumstances of the case he could not answer that question. The same mining manager was there, but he was not subjected to the same mining supervision as when he (Mr. Kitto) was at the mine. The new gutter, if it was payable, as Mr. Lamb said, would last for ten years. He had not the slightest doubt that by fair and honest working it would take at least ten years to work out the Central Mine. The mining captain was a particularly nervous man, and had been kept because he was known to be thoroughly honest, and, probably, if a burst of water had taken place, the mine captain had reported to Mr. Lamb that the mine should be abandoned, and Mr. Lamb not being a miner was unable to form an opinion on the matter.

Mr. ROBERTS asked if Mr. Kitto was still officially connected with the mine?

The CHAIRMAN said that subject had not been under consideration.

A SHAREHOLDER asked why Mr. Kitto left the mine at such a critical juncture?

Mr. KITTO said that as managing director of the company he left the colony principally to meet the shareholders, in order to explain to them certain differences that had arisen between himself and the directors. He then at some length referred to the details of the last general meeting, stating that he considered he had been badly treated by the directors. He was appointed under the deed managing director, and devoted his time, or sufficient time as he deemed necessary, to the management of the mine. The company got into difficulties, and it was only in consequence of his generalship, the company being insolvent, that it now possessed an inch of property in the colony of Victoria. He then entered at some length into the details, and explained the conditions upon which the Duke of Cornwall Mine had been sold to another company.

The CHAIRMAN said he had always informed the shareholders that a great deal of credit was due to Mr. Kitto for the exertions he had made in securing the sale of the Duke of Cornwall Mine, the whole of the circumstances of which had been laid before the shareholders.

Mr. KITTO, in reply to questions, stated that the Duke of Cornwall was one of the finest mining properties in the southern hemisphere. He succeeded in selling it, and the 1050*l.* that appeared as commission had been paid away by him in various ways to secure the sale of the property.

The CHAIRMAN said that what the directors wanted with regard to the amount charged as commission was the various items, because Mr. Kitto, as trustee of the company, could not be legally entitled to any charge for commission.

Mr. KITTO wished to disabuse the minds of shareholders that he had acted as trustee; he acted at his own risk. He retained his original interest in the company, and if the shareholders allowed the Central Mine to pass out of their hands they would act very unwisely.

The CHAIRMAN said that 5000*l.* would be as much as they would require to develope the present discoveries—that is, to clear off the debt and develope the mine. Of that sum 2500*l.* had been promised conditionally upon the whole sum of 5000*l.* being raised.

Mr. KITTO, in reply to a question, stated that the working value of the plant upon the mine was about 8000*l.*, its break-up value about 3500*l.* The value of the mine itself might be judged from the fact that, after an examination of it by agents, some local shareholders subscribed 30,000*l.* for an adjoining property. The new gutter reported upon by Mr. Lamb was being driven under his (Mr. Kitto's) supervision before he left the colony; it was a little deeper than the working on the branch lode. The latest telegram was that the gutter was really cut. It would take some time before sufficient "dirt" could be got out to pay the costs of the mine. Judging by the tone of Mr. Lamb's telegram, it was clear that if the present meeting separated without taking energetic steps to protect the property they would be doing wrong as miners, as it was a property deserving the attention of any person desiring to invest in mines. As he had already said, he still held his original stake in the company, and would not sell it unless at a good profit. He estimated that it would take about two months' work before the mine would be paying its costs.

After lengthened discussion, it was agreed that the directors should communicate with the shareholders to determine upon the best course to be pursued.

A vote of thanks to the Chairman terminated the proceedings.

BIRDSEYE CREEK GOLD MINING COMPANY.

The annual general meeting of shareholders was held at the offices, Austinfriars, on Tuesday,—Mr. J. T. P. PECHEY in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The report of the directors stated that during the past year 3842·22 ozs. of gold have been obtained, realising 14,870*l.* 13s. 3d., at a cost (including 3404*l.* 19s. 7d. expended on the new tunnel), of 10,044*l.* 10s. 1d., leaving a net profit profit, including sales of water, of 4945*l.* 4s. 2d. Two dividends, aggregating 3000*l.*, have been paid during the past year. The balance at the credit of profit of profit and loss account is 2455*l.* 7s. 5d. Adding to this the amount of profit remitted to June 8 (600*l.*), there remains a balance of 3055*l.* 7s. 5d.; out of this the directors propose to declare a dividend of 2s. per share, free of income tax. This will absorb 1500*l.*, leaving 1555*l.* 7s. 5d. to be carried forward. The workings during the past, as in the previous, year have been entirely confined to the top and side dirt. The new tunnel, which at the date of the last advices was in 950 feet, will be completed about the end of September, and will, after the small remaining portion of drifted ground has been washed away, command the channel or blue lead throughout the whole of the Neece and West and Brown's Hill Claims, and afford washing on the rich ground for many years to come. When it is considered that if the amount expended in running this tunnel during the past year be deducted from the total working cost profits have been earned equal to 12½ per cent. on the company's capital, some idea may be formed of what may reasonably be expected when work is fairly commenced on the channel or blue lead. The directors cannot conclude this report without reiterating their belief in a brilliant future for the mines of this company; and, in the words of their last report, would "express their undiminished confidence in their future prosperity, when once the necessary works for their full development are completed."

The CHAIRMAN said that in working hydraulic claims there is very little to report from time to time, especially when shareholders were kept posted by the periodical published reports. Upon such a large area of auriferous gravel as that possessed by this company the working simply resolved itself into a question as to the amount of ground that could be washed in a given time, except that they were not yet washing the "blue lead," which was a very rich stratum of auriferous ground lying immediately upon the bed-rock. This "blue lead" could only be washed by means of lengthy and costly tunnels. It ran through everyone of the claims owned by the company, but as yet they had not been able to attack it at any one point, and to this fact was to be attributed the circumstance that, although the workings of the year had resulted in a moderate profit, they were not nearly so great as there was every reason to believe would be realised in future years. (Hear, hear.) When they met last year the water had been nearly exhausted in the company's ditch, but they had bought one head of water, which they thought would enable them to run until the end of the year. They were able to run till October, when they were obliged to suspend the works for a couple of weeks. The present being an unusually dry season, he was afraid they would not be able to run more than a month or two longer. Under these circumstances, and washing top and side dirt only, a profit of 8340*l.* had been fairly earned, but, having no working capital, that profit had been partly expended in enlarging and repairing the ditch and in meeting the tunnel cost. Everything had been done to keep the cost as low as possible, the cost of the past year having been 5636*l.*, as against 8428*l.* the previous 12 months, showing a reduction of 2000*l.* in the working cost; they had also endeavoured to carry that economy all through the company's affairs, the result being that the office expenses had been reduced 300*l.* per year. The one great point to be attained was the completion of the tunnel, and until that had been accomplished they could not reach the richest portion of their ground. Shareholders had seen by the reports what had been done up to June 9, since when a letter had been received, dated June 20, which states:—

"I have been running steadily in Uncle Sam claim up to this date with the two heads, but as the ground where I was using bought head is worked out I shall be compelled to drop this head, and only wash with the head from company's ditch the remainder of this season; at present there is water sufficient to run the one head, and keep the pump and hoisting works in shaft running. I hope to be able to buy from South Yuba Canal Company to keep this head up the greater part of July. The contractors will be sure to make the shaft by the 25th inst., and we are on the last hundred feet in shaft tunnel, so that, if all things go favourably, we shall be ready to wash through new tunnel by the time stated in a previous letter —September 30."

The amount of profits during the past year, if available, was equal to 12½ per cent. upon the capital realised from the "top dirt," so that when the "blue lead" could be fully attacked the returns and profits could not fail to be largely increased. The next season would commence at the end of December; some small portion of drifted ground would have to be run through before the "blue lead" was reached, and from that time there would be work enough in sight to last for the next seven or eight years. On the Uncle Sam claim there was work enough for ten years, and when they get a tunnel at Red Dog and Waloupa, no one acquainted with such matters could say otherwise than the Birdseye Creek Company must prove a brilliant success, the more especially when it was remembered that from the "top dirt" they had realised a profit equal to 12½ per cent. upon the capital of the company. (Hear, hear.) The company had no liabilities and no debts, and had a cash balance to-day of 2300*l.*, and a telegram had been received advising a profit of $5000, of which $3000 had been set aside towards finishing the new tunnel. The board had declared another dividend of 2s. per share. There was no doubt they possessed a very valuable property, and that in future years it would yield very handsome profits. At the last meeting he stated that the United States patent would shortly be obtained, but at that time a change occurred in the American mining law which had caused some delay, but within the last few days a letter had been received from the company's solicitors, which stated:—

"We are pleased to inform you that the application made for patents to the mines of the Birdseye Creek Gold Mining Company (Limited) are now in such condition as to warrant us in the statement that they will be obtained at an early date. All controversies and disputes (they were numerous and very perplexing) have been amicably arranged. No protests or advance claims have been filed, and the time for filing same has elapsed."

All he in conclusion could say was that there could not be a shadow of doubt that Birdseye Creek would continue to pay very large profits, at least during the lives of the present shareholders. (Hear,

hear.) He then moved that the report and accounts be received and adopted.——Mr. STEELE seconded the proposition.

The CHAIRMAN said their superintendent wrote under date June 20 in rather a stronger tone than ever before. He says—

"The prospects look flattering for next season's washing, and with an average water season the company may expect much better returns than any heretofore."

The CHAIRMAN, in reply to questions, stated that even in the dry season, by husbanding water, it was hoped sufficient gold would be obtained to meet the current costs. At the Sweetland Creek only one head of water was run all the year round, and from that they were able to pay, at all events, 20 per cent., because they were running on the "blue lead." The Neece and West, with two heads, might fairly be estimated to yield something considerably greater. He hoped when the "blue lead" was being fairly attacked the profits made in the first half of the year would be sufficient to pay 20 per cent. for the whole year. (Hear, hear.) Eventually they would have to run tunnels into all their other claims, but when in full operation $500 per month would make no appreciable difference in their profits. The returns would be largely increased the moment washings was commenced in the new tunnel, but not so large as when the "blue lead" had been fairly reached.

The report and balance-sheet was received and adopted.

The CHAIRMAN said that Mr. Bowe retired from the board, but being eligible offered himself for re-election. Mr. Bowe was a most valuable director, having resided in California for many years, and last year, while on his own private business, he visited the property, which resulted in the appointment of the present superintendent, who was a very able man. The company was very much indebted to Mr. Bowe.—Mr. Bowe was unanimously re-elected director.

The retiring auditors were re-elected.

The CHAIRMAN said they had something like 1000*l.* in hand after paying the dividend just declared. The company was in an excellent financial position; the only liability was probably 200*l.* in connection with the United States patent.

Mr. STEELE proposed that the best thanks of the shareholders be passed to the Chairman and directors for the manner in which they conducted the affiairs of the company during the past year; their duties had been discharged well and ably, and he hoped and trusted that the reports he should peruse in the *Mining Journal* from time to time would be of a progressively satisfactory character. The shareholders were greatly indebted to the Chairman for the very lucid way he had explained the position and prospects of the company. (Hear, hear.)

The proposition being duly seconded, was put and carried unanimously.

The CHAIRMAN having acknowled the vote, assured the proprietors that everything would continue to be done to promote the best interests of the enterprise. Shareholders might rest perfectly satisfied that they were going to make this company as successful as any that had come from the United States. (Hear, hear.)

The proceedings then closed.

PHOSPHORITE COMPANY.

A general meeting of shareholders was held at the company's offices, Queen-street-place, on Thursday,

Major COPLEY WRAY in the chair.

Mr. A. PULBROOK (a drector) read the notice convening the meeting and the minutes of the preceding one, expressing regret that the absence of their secretary was caused by illness.

Mr. RICHARD TAYLOR read the statements of accounts, embracing the costs and returns from Oct., 1871, to the end of March, 1873, and the balance-sheet of the company to the end of March, 1873. The account of costs and returns showed a debit balance of 2078*l.* He then read the subjoined report of the directors:—

It had been our intention to have called the shareholders together in general meeting in the month of June, as in 1872, and to have submitted the accounts of the company's operations from its commencement, in October, 1871, to the end of December, 1872; but as, in fact, we did not get into effective working until after the conclusion of the winter of 1872, it was thought more desirable to postpone the meeting, so as to be able to present to you the accounts up to the end of March in the present year, which we are now enabled to do, although holding our meeting only one month later than last year. The history of the company's operations is so clearly and completely given in the reports of Mr. Garland, the resident manager, that it is unnecessary for the directors to trouble you with a repetition of the details which he has given. The account of costs and returns, and balance-sheet, which have been audited by Messrs. Good and Co., show you completely the position of the company on March 31. The results exhibited by the former of those accounts are certainly not such as we had hoped might have been realised, even in the outset of our undertaking. The arrangements for the formation of the company occupied about six months, and were not completed until too late a period in the year 1871 to allow of active working being commenced before winter set in, so that it was not until April, 1872, that we set to work in opening the mines, and much extra cost was occasioned by the repairs and clearing of shafts and levels damaged by having been out of work during the winter, while at the same time a very trifling return of phosphorite was, during the first six months of 1872 brought against the expenditure. In July a fair start was made in raising phosphorite, the quantity for that month having amounted to 425 tons. In August 566 tons were raised; in September, 690 tons; in October, 579 tons; in November, 599 tons; and in December, 340 tons, giving an average monthly quantity during that half year of 533 tons. Had we been able to continue our operations during winter on that active scale we should have earned a profit, instead of incurring the loss which is exhibited by the account of costs and returns; but we were compelled, by the want of sufficient working capital, to curtail our monthly expenditure, by diminishing the raisings of our mineral, as well as by suspending many important works for exploring and laying open ground for future produce. The market for phosphorite is active in spring, and in the fall of the year; but in the height of summer and in winter the sales are much diminished, and it is necessary to stock the produce, so that during these seasons the expenditure must in a great measure be met by the employment of floating or working capital; and, having failed in placing the whole of the reserve shares, the amount represented by the 276 unissued (2760*l.*), caused a deficiency, which most prejudicially influence our proceedings. The purchase of the concessions and mills of Messrs. Von Rath and Co. absorbed a further amount of 10,500*l.*, and necessitated the issue of 5000*l.* debentures, to meet in part the cost of such purchase. Those debentures have been issued and paid for, much the larger portion being taken by the directors and their friends. If the remainder of the reserved shares can now be placed, we shall have sufficient funds to complete our outfit of machinery, but we shall still require some 3000*l.* to 5000*l.* as working capital to cover the expenditure during the seasons of slack sales, and to enable us to stock our produce instead of interrupting our works.

Mr. RICHARD TAYLOR said they would allow him to apologise for the report not having been prepared earlier and forwarded to them, but the directors were anxious that an inspection of the whole property should be made by himself. Owing to other engagements he could not leave England until early in the present month of July, but he had since made a pretty complete examination. The report now submitted to them was drawn with the knowledge, on the part of the directors, of the information he was able to collect, and the impressions he had brought home from the property. As the report of their manager, Capt. Garland, would be printed and circulated among the shareholders, it would probably suffice for the present if he read the summary of the report and the concluding remarks only. Captain Garland stated that there were several points which were very satisfactory: 4020 tons of phosphorite had been raised during the year, and the mills were making fair progress; 609 tons were sold last year, whilst in the present year they had sold 1223 tons up to the end of March. They had secured the custom of some good German houses, and were now raising 300 to 350 tons per month. The scale of mining operations should not, Captain Garland thought, be increased until the present stock of crude had been disposed of. It was most desirable that they should have extended washing power and milling machinery, and as the mines became developed good results might be anticipated. In a supplementary report—for that which he had been reading from was prepared early in the year, and only extended to the end of December—Capt. Garland brought the information down to the end of March. He expressed renewed confidence in their prospects, and stated that the cost of the milled phosphorite delivered at Ober Lahnstein was 1*l.* 9*s.* per ton, and they might expect to reduce the cost of washing from 8*s.* 6*d.* to 3*s.* 8*d.* per ton; but taking it that the reduction was to 4*s.* 6*d.* only, the increased profit to the company would be 4*s.* per ton. In conclusion, he (Captain Garland) felt confident that the concern would prove profitable and lasting.

The CHAIRMAN said that in offering the report for their adoption he would remind them that, although nominally it extended over 18 months, the company was not really in existence until March, 1872, for it was not until then that the directors were appointed. Mr. Richard Taylor, as they had heard, had recently been to the property, and last Tuesday, at their board meeting, gave them a minute explanation, and the directors had great confidence in the property. The company was started with a nominal capital of 40,000*l.*, out of which 22,000*l.* was paid for the mines, leaving 18,000*l.* working capital; but, as 1000*l.* was expended in preliminary expenses, this was reduced to 17,000*l.*, assuming all calls paid up. They (the directors of the company) thought they would only have to ship the ore and sell it, but they found that the phosphorite had rather too much iron in it to be suitable for export in the crude state, or readily saleable in England. In Germany they used the phosphorite merely ground, and did not object to the iron. They would remember that in consequence of this it was thought desirable to purchase the mills and works of Messrs. Von Rath and Co. at the junction of the Rhine and Lahn, for which they paid 10,500*l.*, which reduced their working capital still further. In September last they had reached nearly 700 tons per month, but as they then found their finances getting short they were compelled to limit their production. The directors then issued debentures at 7½ per cent., all of which had been paid up. In the spring of the present year there was a ready demand for phosphorite, but as Capt. Garland had not the machinery necessary to deal with the large accumulations of stuff he could not press it upon the market. Mr. Jordan, a practical engineer, had since been sent out to make arrangements for the construction of additional washing machinery, and a new washing machine was now nearly ready, and would be sent out in about a week. They had 276 unissued shares, representing 2760*l.*, and if these were taken it would provide the necessary capital to complete the outfit of machinery. The original vendors and the directors had agreed to take up their proportion of these shares, leaving only 90 shares, or 900*l.* to be issued to the public. They would not require more machinery than they were now providing for for some time to come, but would want more working capital. The German market was very peculiar, there being very few sales in winter, a good demand in early spring, scarcely any demand in summer, and a demand again in the autumn. They must, therefore, always look to the locking up of a large proportion of the working capital. To provide this it was necessary that they should issue preference shares to the extent of 4000*l.* or 5000*l.*, as otherwise it would be impossible to carry on the concern to a profit. There were several other German companies and the German Government all working to a profit, and it would be indeed curious if they, with the advantage of English machinery and management, could not succeed in doing the same. He concluded by moving the reception and adoption of the report and accounts.

Mr. F. W. BIGGE seconded the resolution, which was unanimously agreed to.

Mr. RICHARD TAYLOR might, from what he had seen at the property, tell them a very long story, but they would probably prefer hearing his conclusions, which were that the property was one which would afford large returns of the phosphorite—indeed, almost inexhaustible quantities—and would give a profitable business for a great number of years. He would begin with the concessions of Heckholzhausen and Mudershausen. There were others of great extent, giving them the right of search, but the directors had decided for the present to concentrate their efforts upon these. There was the smaller concession of Bermbach, which produced a very rare quality of phosphorite, giving a high percentage of the tribasic phosphate of lime, without admixture of any deleterious impurity—it gives upwards of 80 per cent. of the tribasic phosphate; but, unfortunately, they had there got into a lawsuit for the burgermeister of the village of Bermbach, one of the most ignorant and stupid old men he had ever met with. He had made a second grant of the concession, and as the parties had commenced working proceedings were necessary to regain possession. From Mudershausen they had not yet had a large produce, because they had met with a stream of water, and wanted to put up a small pumping-engine; and, owing to all sorts of formalities having to be gone through, it was some time before they could get permission to put it up. Their new shaft was now down to the Lage of phosphorite, and, as in another working, this proved to be a 10-ft. bed, and the produce was 56¾ per cent. of phosphorite, the result was satisfactory. This part of the property was in the forest, but be believed the deposit would be found over the entire area. They had heard of sales of phosphorite at so much per unit, but they were not aware that the presence of iron made a serious difference in the price it would produce in this country. The Germans do not ask anything about iron, all they require being a guarantee of a certain percentage of the tribasic phosphate—about 55 per cent. to 60 per cent. was found to be the most saleable. Heckholzhausen produced a quality which would sell in England or anywhere else. He had not until his last visit appreciated the great extent of their prospects here: it is under a forest belonging to the Heckelshausener Gemeinde, or commune of Heckholzhausen, which was important, as it relieved them from payment for surface damage. They had merely to comply with certain rules for protecting the trees, and so on, and when they were under corn lands they must pay surface damage and restore the surface to a fit state for cultivation afterwards. They had 700 morgen under this communal forest, and in these work ings they had been carrying on operations during the past year; it was a very fine deposit, of the quality of which specimens were on the table. Then, there were 550 morgen also at Heckholzhausen, which they bought from Messrs. von Rath; this was under the glebe land, and the phosphorite was well situated near the surface. The other 15 morgen which they had in Heckholzhausen were nearly worked out. Mudershausen and Heckholzhausen would give them work for many years to come, the two being equal to a production of 500 tons per month. By the purchase from Messrs. von Rath they had obtained mills and a great increase of acreage: they had 11,000 acres of land. It must not be supposed shat the beds were uniform throughout, but they merely fluctuated in quality, they had not found any great faults. It was a curious formation, being a bed which lies on the surface of the limestone rock; and it is in the hollows of the limestone, which is always of an undulating character, that occasionally very rich deposits are found. They had not had anything very rich, but as their neighbours had they might expect it. There had been a great improvement at Mudershausen and others in the concessions acquired from Messrs. Von Rath at Dehrn and Froschpfuhl. At Froschpfuhl all their concession was in the communal property, and in the Crown property adjoining the phosphorite was being worked by the Prussian Government, and they were getting minerals which assayed 67, 67, 77, and 67 per cent. respectively for the four samples on the table. The Government officials were very courteous, and had lent them a ventilating machine to assist them in getting down their shaft, and had asked permission to continue their working to connect, so as to improve their ventilation. This arrangement was without hesitation acceded to, as it was equally advantageous to the company, and saved half the expense which must otherwise have been incurred. They had now got down to the bed, and had got some good stuff of 67 per cent. The Dehrn concession is on the bank of the Lahn, and the workings had been carried on by the burgermeister of the village, who had made a fortune out of them, and was now living in a good house, which he had built in the centre of the village. That concession would be a valuable one, and it also produced stuff which would sweeten and bring up the quality of the other. Their mills were at the exact confluence of the Lahn with the Rhine. They not only acquired good mills from Messrs. Von Rath, but also three good washing places on the Lahn, and one in the valley at Heckholzhausen. At the latter place, however, there was a miller lower down the stream who objected to their fouling the water, and they were threatened with an injunction; but they proposed to remedy this by establishing their principal washing machinery at Dehrn, on the banks of the Lahn. The importance of washing machinery and mills was not appreciated by the directors at first, and the Germans were satisfied that the phosphorite when finely ground was as good as the super-phosphate, and they believed that the supposed greater value of the latter is entirely due to the fineness which the precipitation ensures. They milled at present at a price which left them a good profit, for they could obtain 10*s.* per ton for milling, whilst it cost them only 6*s.* 8*d.* to mill. They had already, as he had told them, sent a little pumping-engine to Mudershausen, and, with the washing machinery, they would have a very complete plant. Until his last visit he did not entertain nearly so high an opinion as to the inexhaustibility of the mineral.

It was then resolved—"That this meeting, having confidence in the future prospects of the company, and considering it very desirable that additional working capital should be supplied, requests the directors to take the necessary steps to increase the capital of the company by the issue of 500 preference shares of 10*l.* each, and earnestly recommend their fellow-shareholders to subscribe for the same."

Major Wray and Mr. Pulbrook were re-elected directors; Messrs. Good, Daniels, and Co., were appointed auditors, and their remuneration fixed at 10*l.* 10*s.* The usual complimentary votes of thanks to the Chairman and directors, and a special vote of thanks to Mr. R. Taylor, terminated the proceedings.

GWENDRAETH COLLIERY COMPANY.

The annual general meeting of shareholders was held at the offices, Lombard-court, on Monday,—Mr. GIBB in the chair.

Mr. THOMPSON (secretary) read the notice convening the meeting.

The CHAIRMAN said the board regretted they were unable to present a more satisfactory report; but the circumstances that had militated against the progress of the development of the property fully accounted for the delay that had taken place, and probably three months would yet elapse before such results would be realised as they were fully entitled to expect from the admitted value of the colliery. According to the report of Mr. Phillips, who was an authority upon such matters, within a reasonable time the underground workings would be completed, by which other seams of coal would be reached, which would enable them to make a large output. There was no doubt when that took place all that had been held out in the prospectus as to the quantity of coal would be realised. All he could say was that the board, believing that successful results would be obtained, would continue to do their best to secure them in the best possible way, having regard to the permanent interests of the enterprise. (Hear.) He then moved that the reports and accounts be received and adopted. ——Mr. KEMP seconded the proposition.

Mr. EDWARDS complained that he had not received a notice of the meeting.—— The SECRETARY explained that the notice had been sent to the shareholder, whose names appeared in the register, in accordance with the terms of the Articles of Association. Although Mr. Edwards was a joint shareholder with Mr. Hughes, the name of Mr. Hughes only appeared on the register.——The CHAIRMAN said it should be further explained that Mr. Edwards had been the manager of the colliery, but for economical reasons his services had been dispensed with.

Mr. EDWARDS said there was no occasion for any shares to be forfeited. The property was a good one, as would be proved in a very short time. They had great difficulties to contend against both with the men and the railway.

After some further discussion, the motion adopting the report and accounts was put and carried.

Upon the proposition of Mr. STEIN, seconded by Mr. KEMP, the retiring directors (General Duff and Mr. Mark Pinkerton) were unanimously re elected.

Upon the proposition of Mr. HUNTINGTON, seconded by General DUFF, the retiring auditor, Mr. Scott, was re-appointed.

A resolution was passed that the accounts of each year should be brought up to June 30, the annual meeting to be held as soon after as convenient, and not to exceed three months.——A vote of thanks to the Chairman and directors closed the proceedings.

EAST BALLESWIDDEN TIN MINE COMPANY.

The annual general meeting of shareholders was held at the London Tavern yesterday,—Major GREVILLE in the chair.

Mr. G. V. MORGAN (the secretary) read the notice convening the meeting.

The report of the directors congratulated the shareholders on the great success that has attended their undertaking. The company has constructed machinery for stamping and dressing the tin, and for pumping and other purposes necessary for developing and working the mine, as well as the usual offices and buildings. This machinery is complete and sufficient for all the purposes stated, and the directors congratulate the shareholders that an efficient going concern has been created for the company at so small expense. Among the most favourable features which characterise the mine great saving in working expenses result from the fortunate natural advantages of the locality, which give the use of a sufficient water-power for all the purposes of the mine. This is all the more important at a period when the price of coals is so high and appears to be steadily increasing. Actual sales of tin were made within seven months after the incorporation of the company, which sales have been continued at regular periods down to the present time. The workings of the company have hitherto been confined to the *debris* on the surface, in which a considerable amount of tin has been found, sufficient indeed of itself to pay the working expenses of the mine, including the clearing the levels, &c. Lately, however, the Chairman, in company with the secretary, has visited the mine for the express purpose of examining the lodes, three of which have now been reached; nothing could be more satisfactory than the result of their investigation. Since the Chairman's return from the mine the ore from one of the lodes, which was extracted indiscriminately in his presence, has been assayed by the eminent assayists, Messrs. Johnson, Matthey, and Co., who report that the percentage of tin contained in the specimens assayed is 6·60. In the course of a few months the levels will be sufficiently cleared, the mine being now in fork, to enable the directors to operate on the lodes; and they believe then they may be able, having regard to the great richness of the ground as proved by the assay, to effect such sales of tin as will enable them to declare dividends, making East Balleswidden rank with the richest mines in the county.

The CHAIRMAN gave a detailed description of his visit to the mine, and referred to its position and prospects as being of a most satisfactory character. He stated that the reports of the agent were more than confirmed; he had himself taken ore from one of the extreme western ends which gave the result indicated in the directors' report. He expressed an unqualified approbation of the captain, and also of the satisfactory way in which he was carrying out every detail. Everything appeared most encouraging, and the mine being a shallow one there would be no difficulty in obtaining an adequate amount of skilled labour. He moved that the report and balance-sheet be received and adopted.

Mr. T. R. BENNETT seconded the proposition. The fact that their ore contained 6 per cent. of tin was most satisfactory, when, he believed, the ordinary produce did not exceed 1 per cent.

The report of the agent was read, which stated that 189 fms. of ground had been cleared, and the necessary pitwork had been put in down to the 40 fm. level, a 36 ft. water-wheel had been erected (equal to a 36 in. cylinder engine), and ... 36 heads of stamps. The lodes are far better than he expected to find them. ... developing the mine there is every chance of a great success. He believed that ... the next meeting it would pay handsome dividends to its shareholders.

Captain Trahair explained that the mine was not exactly in "fork," now ... any of the ends in the eastern levels yet been seen; before a large number of ... could be put to stope, the "ends" must be cleared, and 5 or 10 fathoms of ground ... driven through. He calculated driving could be carried on at the rate of 2 ... per month. As the coal question did not affect them, the only thing wanted was ... sufficient amount of ground opened to enable them to greatly increase the return. ... Every fathom of ground in the western end would turn out 12 tons of ore, and ... could drive 2 fathoms per month.

The motion adoping the report and accounts was put and carried unanimously.

Mr. BENNETT was re-elected director.

A vote of thanks to the Chairman and directors closed the proceedings.

WEST GOGIGAN SILVER-LEAD MINING COMPANY.

The second ordinary meeting of shareholders was held at the offices, Lothbury, on Thursday, for the purpose of receiving from the directors a report and balance-sheet, and to consider the report on the condition of the mine by Capt. Kitto, and for transacting such other business as may be incidental to the meeting.

Mr. BILLINGS in the chair.

Mr. E. W. LAYTON (the Secretary) read the notice convening the meeting.

The report of Capt. John Kitto, the manager, stated that he had much pleasure in being able to say that since the commencement of operations good and satisfactory progress has been made in the development of the mine, and notwithstanding no very startling discoveries have yet been made, he is decidedly of opinion, judging from past experience and present indications, that they will in a comparatively short time open up a paying and profitable concern. In the sinking of the engine-shaft there has been a steadily progressive improvement in the general bearing character of the lode as greater depth has been attained, and he is sanguine to get the "lodge" finished at the 12, and the new level started off, so that we may be able to resume the sinking of the shaft for another level (12 fms. deep) with as little delay as possible, as he is of opinion, judging from the improved character of the lode in the bottom of the shaft, that it is from the deeper workings ... they have principally to look for profitable returns.

The CHAIRMAN said that while he had nothing to add to the information contained in the report and balance-sheet, there was every thing to encourage them in the future development of the mine. In this statement he was not only expressing the opinion of ... practical men in the district, but was giving the result of his own personal and repeated examination of the property. The available assets amounted to very nearly 4300*l.*, besides which there were between 3000 and 4000 unissued shares: they need, therefore, be in no apprehension that there would not be sufficient means to open the mine and provide the necessary machinery with which to work it, without reference to the unissued shares. There could be no doubt that the mine contained large quantities of ore containing silver-lead; that had been proved by what would be seen on the surface, as well as that developed in the mine.... But sufficient had not yet been seen to warrant the construction of machinery, but the moment they were perfectly satisfied upon that point the proper machinery would be at once constructed. Several surface erections had been erected and paid for, such as an account-house, &c., and two washing-tables being prepared out of the stone obtained from the mine. He had urged the ... of this because, personally, he had entire confidence in the mine. There was especial feature which induced him to have the most complete confidence, ... was this—they were assured by the captains of the old Goginan Mine that the ... rations in West Goginan were upon a continuation of that lode which in Gogi ... yielded such enormous profits. He confessed that at first he did not consider ... such was the fact, because the character of the ore was at first different, but ... cutting through the rock in the lode—a rock of a far more solid description ... the lode itself, the entire character of the matrix and ore entirely changed. ... same feature was met with in another mine with which he was connected—... Grogwinion. There in the adit, in which was a lode 2 ft. wide, they suddenly ... upon unproductive rock, but at a distance of about 20 feet a string of almost ... lime was opened on, from which point the lode had continued ever since. A ... interruption had taken place in West Goginan, but the lead ore was again ... reached, and there was no doubt that in depth the lode would become progressively richer. At Grogwinion the ore actually laid bare was of greater value than ... whole of the capital of the company. And as to West Goginan, he had every ... to believe that before he met the shareholders again something of importance ... have been realised—that is, if there was any truth in the evidence of the rocks ... which the mine was composed. The last report of Capt. Kitto indicated that ... mine was gradually and decidedly improving, and there could be no doubt that ... velopment only was required to ensure success. Having referred to a City ... who had been offering the company's shares with a guaranteed dividend of 7½ ... cent. per annum, with which the said) the directors had nothing to do, he ... that the report and balance-sheet be received and adopted.——Mr. PATRICK ... the proposition.

A SHAREHOLDER understood it was not intended to issue the whole of the ... but it seemed to him that in opening up a mine like this it was somewhat ... to the shareholders not to place the whole of the shares. And if the mine ... prove a great success, there was no guarantee what was to be done with those ...

The CHAIRMAN said his own impression was that small shares like these ... always be paid up in full—at least, he had done so, although holding a good ... ber. The directors believed they had enough in hand and to call to pay for ... whole development of the mine. There were 3549 unallotted shares, and his ... pression was that they should not be issued, at any rate, until when the mine ... have proved a success, and then if it were necessary allot them *pro rata* among ... shareholders, or sell them at a premium for the benefit of the company. In no ... would those shares be issued without the sanction of shareholders, and then ... upon such terms as might be agreed upon.

The report and accounts were received and adopted.

A unanimous vote of thanks to the Chairman and directors closed the proceedings.

CARN GALVER TIN MINING COMPANY.

The ordinary general meeting of shareholders was held at the offices, Finch-lane, on Wednesday,

Mr. W. I. HETHERINGTON in the chair.

Mr. RICHARDSON (the secretary) read the notice convening the meeting.

The CHAIRMAN: I think before making any remarks Mr. Richardson had better read the report of Capt. Roach, who is here.

The SECRETARY then read the following report from Capt. Roach which had been received that morning:—

July 14.—When we first proposed the starting of this mine, shaft No. 1 ... deepest on the mine, the only one sunk by the late company, or used by them ... any extent, was clear from the surface to the 120 fm. level, but previous ... commencing operations the upper part to the extent of 10 fathoms had fallen ... Part of the stuff so falling went to the bottom of the shaft, part of it was cast ... the 10 fm. level, 20 fathoms from surface, and choking the shaft at this point ... upper part became filled to within about 3 fathoms from surface. Our first ... was to clear and set this shaft in order, but the heavy rains which fell about ... time threw in so much water that we were compelled to leave it for a time ... water might abate. We then commenced to clear No. 2 shaft, which, though ... found it in a far worse condition than we expected, we cleared and secured ... course to the 50, put in the skp road, and set all in good working order. This ... is sunk to the 60, but these 10 fathoms require to be made larger. The deep ... also was now in course of repair, and though we had some rather difficult pots ... overcome, we succeeded in clearing and repairing the whole length of ... 300 fathoms. The water having considerably abated in No. 1 shaft we resumed ... operations there, and succeeded in clearing and repairing it, put in the skip ... to the 60, ladders, &c., and making all complete to this point. Our winding ... having been set to work we dispensed with our horse-whim, and at once commenced ... taking out ore ground for the foundation of our pumping engine-house. All ... was made in building the engine-house, nothing was wanting on our part for ... furthering the work of building the house or erecting the engine, but seeing ... the engine would not be ready as early as we could wish, we attached the pump ... gear to the winding engine, and were not long in draining 20 fathoms of the ... or from the 60 to the 80, and we should have drained more but the water for ... densing fell off, so that we were obliged to stop the pumping; and this, with ... time it took to transfer the gear to the pumping engine, allowed the water to ... some fathoms, but having got the pumping engine right we soon got the ... down nearly to the 90. Here we found the shaft so bad that we had to attend ... the repairing and securing it before we could drain any deeper. The water is ... down between the 90 and 100. The great object at which we have been aiming ... the lode in the 90 fm. level, said to be a good lode, but we have not yet been ... to reach it. This lode is a great many fathoms from the shaft, and the level ... been so filled with stuff that we have not been able to clear it up to this time, ... we expect in a few more days to clear the level, and to commence working on ... lode. I have within the last few days had the most favourable reports of the ... in this place from one who had to do with conducting the affairs of the mine ... the late company, but, as I have said before, we shall be able to test it ourselves ... a few days at most. We have cleared and repaired several hundreds of fathoms ... levels, not only to have communication from one part of the mine to another ... but also to get at tin ground; to ventilate and to take up water, which otherwise would have gone down in the mine, and would then require pumping. We have sunk No. 3 shaft 23 fms., and have gone through very good patches ... lode. Altogether, the lode in the eastern part of the mine looks very well. ... have driven east and west of this shaft about 30 fms. The lode throughout ... a payable lode, we have also sunk a winze from the 30 to communicate with ... level driven west of No. 3 shaft, in the 45. It will be necessary to put a skip-road ... in No. 3 shaft; we are just as deep as we can go with a horse-whim. We have ... three excellent steam-engines, which are being worked very economically. The ... stamps floor is not yet complete, but we are progressing with it. We are ... being in complete working order; and taking into account our present position ... and prospects, I can but feel confident that perseverance will be crowned with ... success.—JOHN ROACH.

The CHAIRMAN: Gentlemen, we have called you together to-day, rather late we must admit, but the meeting was deferred as long as possible that we might be able to inform you that we had reached the lode in the 90 fm. level, which is likely to be a very valuable one; but the captain informs me that it will be a fortnight before it can be reached. In the meantime we have been in no way disappointed, so far as we can see, with the result of our endeavours in your interests to open this mine up. The only thing in our

at our capital has been rather shorter than is required, but, with
e of increasing that, we are at present in negociations in Cornwall, in which
terests of the shareholders will be carefully protected, for the purpose of
ving the deficient capital necessary to test the whole property. During the
the mines have been going on the wages cost has been more than the get on
that with surface operations and masonry necessary for new machines, sink-
shafts, and new levels; but we have the satisfaction of informing you that
we sold 182l. worth of tin ore; although the prices have dropped, yet the
nt which has been sent to the smelters has been steadily increasing, the pro-
being 114l., 117l., and 166l. Now the new stamping-machine has been got
k the operations are no longer impeded by the old water-stamps, which had
speed, and we could not take the full benefit of the stamping-power through
efficiency of water. The steam-stamps are working satisfactorily, and there
future be no delays on that account, and the amount of tinstone which will
to the stamps will almost immediately be sufficient to pay the wages ac
month by month. The only thing will be to provide for the merchants'
and we intend to provide that money as soon as possible. We have an offer
a banker in Cornwall to mortgage the property if the directors give their per-
guarantees, and we are not at all disinclined to make ourselves responsible
e increased amount. We are already large shareholders, and think this
ld give confidence to the rest of the shareholders that we have every belief in
operty. I think I have now finished what I had to say, but I shall be glad
captain will explain to you the position of the mine, and answer any ques-
which you may choose to put to him. There was a notion at one time of
g the money by preference shares, although I am in favour of the mortgage.
y say that the security for the 2000l. is ample; there are three steam-engines
set of stamps on the lodes. Although we cannot give a brilliant dividend,
we in hopes. The directors have between them 6000l. or 7000l. in the property.
BENWELL: It seems to me that we are a long time getting the water out.
only the pipes. We have had to erect three engines. The whole of the sur-
had not a piece of machinery. It has been a long and arduous task to do.
CHAIRMAN: The pumping-engine was in the pit, but there was no machinery
DIRECTOR said that at the commencement the water-stamp was a great fea-
as it saved coal, but when the mine was thoroughly examined they found
it would not do to trust to the water-stamps, which fail in the dry seasons,
acting under the advice of the late Mr. Michell, they purchased the engines
machinery, so as to get larger quantities without any fear of breaking down.
thought nobody could have foreseen the enhanced prices for things, and also
med the Chairman's remarks respecting the increase of capital. He thought
or seven months they would be able to prove to the proprietors that they
really good property. A circular would be sent to each shareholder, asking
opinion on the method to be used to obtain the increased capital, whether by
ture or preference shares.
ROACH then explained the plan, which was exhibited to the shareholders
BENWELL proposed, and Mr. LORD seconded, a vote of thanks to the Chair-
which was carried.
BENWELL also proposed a vote of thanks to Capt. Roach; this having been
ded and carried, Capt. Roach replied, and the meeting separated.

WHEAL BULLER MINING COMPANY.

the meeting of adventurers, on Friday (Mr. T. PRYOR in the
r), the accounts showed a debit balance of 1532l. The arrears of
owing amounted to 180l. A call of 3l. per share was made. It
also resolved that in consequence of the very high prices of ma-
ls and labour the operations in the bottom of the mine be sus-
ded for the present, that the 50 fm. level on the north copper lode be driven
d speed towards Wheal Basset, and that the necessary means be adopted to
ne Wills's shaft on the south, or old Wheal Buller main lode, if upon investi-
and further enquiry such is deemed advisable. Some of the shareholders
ressed very high opinion of the south ground, and hoped it would be vigor-
prosecuted. The agents' report stated:—"In consequence of the high price
general materials we have suspended most of our tutwork operations. On
north copper lode, at the 50 fm. level, we have a lode of copper worth from
10l. per fathom; and in the back of the level, about 3 fms. behind the end,
have a pitch working at 5s. 6d. in 1l., worth about 12l. per fathom, cost of
ning about 3l. per fathom. We would strongly recommend you to commence
ations on the south, or old Wheal Buller, part of the mine, which can be done
ply, and where there are 250 fms. in length of whole ground, and we know of
one of unworked ground in the county offering better chances for the produc-
of copper." The services of Capt. Inch were dispensed with, also the clerk
June). The salary of the purser, Mr. T. Pryor, was reduced, also that of the
urser, Capt. C. Thomas.

ABERDAUNANT LEAD MINING COMPANY.

The fourth ordinary general meeting of shareholders was held at
the offices of the company, New Broad-street, on Tuesday,

Mr. C. S. HILL in the chair.

Mr R. SMITH (secretary) read the notice convening the meeting.
The CHAIRMAN: It has once more fallen to my lot to address a
few words to you on the affairs of this company. The remarks I
have to make will be very much of a running comment on the re-
ports of the directors and of Capt. Toy, which have been issued to
the shareholders, and which are embodied in a condensed form in
the report. This meeting has been summoned at a later period than
was intended, in order that the directors might be empowered to
sanction the reduction of the nominal capital. Although the question was simple
in itself, it has been a tedious and wearisome affair, owing to the technical objec-
tions which have been thrown in its way; but common sense has at last had its
way, and the Vice-Chancellor has finally given an order in our favour. In the in-
terval which has elapsed since last meeting the directors have kept steadily in view
the importance of bringing the mine into a profitable and paying condition. The
working levels have been extended, and the stoping carried on satisfactorily. The
cross cuts which have been begun have been carried down to the 10 below the deep
adit, and levels have been driven east and west with favourable indications for
the future. The limited amount of working capital at our disposal has cramped our
movements to some extent, and the unexceptionally wet character of the autumn
and winter months of last year has materially interferred with the out-door ope-
rations of mines. In addition to this, there have been new works of considerable
importance in the crushing department, and for storing water, and alterations to
the dressing-floors. No want of activity on the part of the manager at the mine
will be evident from his statement appended to the directors' report, showing the
amount of work executed by him. The directors have to express their confidence
in his integrity and general fitness for the post he occupies. I believe, although it
is not noticed in the report, that there is a parcel of 21 tons lead sampled and ready
for sale, which has been accumulating before Capt. Toy took the management. The
fullness of the result compared with the anticipations held out have been a matter
of disappointment to us, as it will, no doubt, be to the shareholders. Had the yield
of ore corresponded to the expectations formed the position of the company would
have been one comparatively free from anxiety, but I am bound to say that the piles
of ore on the surface, presents a showy external appearance, but when subjected to
actual tests have yielded a low class average. The labour of extraction, crushing,
and dressing has been costly and tedious, and has prejudically affected the balance
sheet which we have to show. Instead of the small balance of unexpended capital
now appearing to credit, had our expectations been realised we should have had a
much more respectable figure, as an available asset in the account. From the levels
and stopes in which ore has been broken up and got ready for sampling we shall
take a fair sum to our resources: but, on the other hand, there are current monthly
expenses to be provided for, and it would not be safe or wise to count on these re-
sources. We have, I think no reasonable doubt can be entertained, a very valu-
able property, and it has been so reported by men of honour and respectability,
and the current opinion is to that effect. The question arises whether it will not
be necessary to increase our capital. With the favourable indications of ore in dif-
ferent parts of the mine such a course could be easily adopted. One of our near
neighbours has achieved a great success, and another, if accounts are to be taken
as pretty true, is approaching one. I am confident that we are in a rich country,
and only want the means of properly working the mine to ensure success. I be-
lieve that when these subjects are considered by our proprietary there will be no
difficulty to raise the necessary capital when I bring the subject forward, which
may not be yet, but when it does we have a fair, reasonable, and almost certain
prospect of success attending our efforts. Having now disposed of the business
matter to this meeting, I pass on to a much less agreeable subject, and one that
I can only be approached with feelings of astonishment and pain. The gentleman
who is here present, Mr. Endean, who is the owner of a large number of shares, and he
has thought proper within the past few days, I believe, to send out to his brother
shareholders a circular reflecting in a most unwarrantable way on the gentlemen
managing the affairs of this company.
[The SECRETARY read the circular, which came into his hands from a shareholder
on Friday.]
The CHAIRMAN continued: Without wishing to exaggerate the matter I regard
this circular as a deliberate attack on the honour, credit, and reputation of the
gentlemen composing the board, including our respected secretary (Mr. Smith).
(Hear, hear.) It can have, I think, no other meaning: its obvious intention, con-
veyed in the inuendo and parathentical remarks, which does not alter the thing at
all, is to implicate the officials in this company with falsifying the accounts; for
I consider the term used equivalent to falsification. If there were any truth in it
we should be utterly unworthy or unfit to show our faces before you, and I do not
understand how any gentleman can reconcile it to his sense of fairness to make
such a statement; it is unworthy of any gentleman. (Hear, hear.) The mode in
which it has been done confirms the view I have taken. To whom it has been
sent I have no information.
A SHAREHOLDER: Only to his own friends.
The CHAIRMAN: The shareholders can form their own judgment of the facts
now presented; but I do not think it would be doing justice to this question to
leave out the possible motives for this proceeding, for it seldom happens that pure
malice prompts to such an action as this. Now, the shareholders can be divided
into two classes—those who were shareholders anterior to last year's meeting, and
those who have joined since. Those who were present were cognisant of all that
took place. Mr. Endean was present, and actually made remarks reminding the
meeting of his having taken up a large amount of unissued shares. To those who
have since joined the meeting, they were in possession of all the information the report
and balance-sheet conveys, which is a clear contradiction to what Mr. Endean
has asserted—(hear, hear)—and stripping it of every vestige or semblance of truth.
The report was, according to hearsay, only sent to those who joined the company
since last year. The retention of a seat at the board is a matter of insignificance
compared to losing one's character. I could not sit under a charge which implies
that I have forfeited my right to be considered an honest man; for it is not pos-
sible for the report to be presented with an item of 5000l. omitted. I hope Mr.
Endean may be able to explain it, though I do not see how he can do so. I speak
on behalf of my colleagues and the secretary, who feel with me all I have stated.
I am to a certain extent their mouthpiece, at the same time that I express my own
feelings. (Hear, hear.) I move that the report and balance-sheet be adopted.
Mr. J. S. CROWLEY seconded the motion.
Mr. ENDEAN moved as an amendment that this meeting be adjourned to this day
fortnight, and also the appointment of a committee selected from the shareholders
to investigate the accounts of the company, and report thereon. Mr. Endean went
through the various items, and said he had not received the last year's balance-sheet.
He thought Captain Toy the right man, but endeavoured to show that he had been
mistaken in his calculations.——This discussion, which was taken part in by Mr.
Endean, Mr. Taylor, Captain Toy, and the Chairman, was kept on for some time,
and very personal remarks passed between Messrs. Endean and Taylor.
Mr. ENDEAN'S amendment, seconded by Mr. BINKS, was put and lost. The
original motion was then carried.
Mr. D. C. HOOKE moved, and Mr. TAYLOR seconded, that Messrs. C. S. Hill and
G. F. Hill be re-elected as directors of the company; this was carried. The retiring
auditors, Messrs. Alison and Swaffield, were re-elected, having been proposed by
Mr. Hooke, and seconded by Lord De Mauley.
Mr. CROWLEY moved, and Mr. TAYLOR seconded, a motion to the effect that the
circular issued by Mr. Endean was untrue, and expressing unabated confidence in
the honour, integrity, and ability of the directors. After a few remarks from the
secretary and the solicitor this motion was put and carried. Mr. Endean demanded
a poll, which was taken and proved in favour of the Chairman's original resolution.
Mr. TAYLOR proposed a vote of thanks to the Chairman and to Captain Toy, Mr.
CROWLEY seconded the resolutions, which were carried unanimously.
The Chairman and Captain Toy having briefly replied, the meeting separated.

BLAEN CAELAN MINING COMPANY.

The half-yearly general meeting of shareholders was held at the mine, near Talybont, Cardiganshire, on July 11. After a ride of 13 miles from Aberystwith, all the members present went up to Esgair-hir, or as it was called of old, "Welsh Potosi," adjoining Blaen Caelan on the east. After spending about three hours there in a full inspection, the business was resumed at Blaen Caelan on the return. The Blaen Caelan Mine possesses a fine field of machinery, consisting of 40-ft. wheel, a 20-ft. wheel, a 16-horse power steam-engine, made and supplied by Sir F. M. Williams, Bart., M.P. (Perran Foundry), 36-inch crusher, four patent Remfry jiggers, and all other necessary appliances for a large work. Mr. ARTHUR BIRCH in the chair, and present a full quorum of members.

The notice of the meeting, and the minutes of the last, having been read, the balance-sheet was presented: this showed a balance of liabilities of former company yet to be discharged as per Articles of Association, 698l. 4s. 3d.

An elaborate report from Capt. W. H. Tregoning was then read.

The CHAIRMAN begged to move that the accounts be received and adopted; which, having been unanimously passed, Mr. BALCOMBE (managing director) said that the members present had this morning, on his application, had the opportunity afforded them of a visit to the Esgair-hir Mine, of seeing the surface arrangements there, and the large piles of lead ore which were being hauled up the shaft and trammed to the picking tables. This opportunity, so interesting at the present junctnre, had been obtained through the kindness and courtesy of Mr. Richard Gibbs, the chief proprietor in the Esgair-hir Company, and which courtesy extended so far as to enable him (Mr. Balcombe) to go underground. After descending 50 fathoms from surface (30 fms. under adit) he was very much gratified by seeing a splendid lode exposed for a considerable length. Two winzes have been put down from the bottom of the 20 through to the 30, and the latter level extended from winze to winze, 11 fms. apart. The stope of the ground above the 20, near to the western winze, exhibited a magnificent lode for 2 ft. wide, more than half of which was quite solid, high-classed silver-grained lead ore, whilst about 4 fms. above the 30 the lode in the more eastern winze was being cut abroad fully 6 ft. wide, which was equally good in proportion to its increased width; and the object of his visit was to dial the run of these deposits as an index to that of the same lode in their own sett; and in both the workings referred to he found the bearing to be about 5° south of west.

The CHAIRMAN: Judging from what we saw on the floors the lode must be very rich and massive, and such a discovery should tend to enhance the value of our property, through which the same lode must traverse for more than 1½ mile, and I see that the lode is supposed to be cut in the costean pit.

The AGENT: It is so, but such intersection is at too shallow a depth to be of value, and, therefore, a level is being driven from the lowest point of the surface into the hill side.

Mr. BALCOMBE: The 40-ft. wheel having been started to unwater the workings asked the agent if he had been able to ascertain the rate at which the water was being forked?——The AGENT: With the present stroke about 3 ft. in 12 hours will be drained, but presently he would lengthen the stroke from 4 to 6 ft., and so increase the speed of forking the mine.

Mr. BALCOMBE moved, and Lieut.-Col. The Hon. C. S. VEREKER seconded "That a special vote of thanks be given to Mr. Richard Gibbs and to the other proprietors in the Esgair-Hir Company for their extreme courtesy in permitting the members of this company present to visit that mine, and also to their agents for their attention." Carried unanimously.

A cordial vote of thanks was passed to the managing director and to Captain Davis (Bronfloyd), who had gratuitously rendered much assistance to the agent.

Mr. BALCOMBE in returning thanks said that he would continue to use his best efforts to promote the best interests of the company. He could not command success, but he was strong in his opinion that the workings of the old mine, when resumed with the light thrown on the run of the lodes by the recent discoveries at Esgair-hir, would yet turn out well. The success of the company was so identical with his own that to neglect any means to that end would be most detrimental to his own personal interests.

The usual complimentary vote to the Chairman closed the day's proceedings, which occupied eleven hours from the starting.

BRONFLOYD COMPANY.

The half-yearly general meeting of shareholders was held on the mine, on July 10,

Lieut.-Col. the Hon. C. S. VEREKER in the chair.

The usual preliminaries having been disposed of, the balance-sheet, showing a credit balance in cash, ore bills, &c., of 1698l. 11s. 5d., and the subjoined report of the agent, were submitted:—

July 9.—During the six months we have raised and sent off 106 tons of silver-lead ore, principally obtained from the 62, 73, and 84 fm. levels of the north lode. You are aware that when I took charge of this mine that the levels were stoped underhand, and all the stuff so raised was at once brought out to the floors; but, as that mode of working would, if continued, have soon run the mine together, I immediately changed to stope overhand, and, consequently, there now remains fully one-third of the orestuff under the men's feet on the stulls, and this quantity I estimate at 160 tons of lead ore, which will be brought out after the ground in any one level is stoped high enough. It has been stated in former reports that the late agent was forced to work the mine in that un-minerlike way for about eighteen months, in order to keep up the returns whilst the dressing-floors were in course of reconstruction. The evil of it is felt now, and causes the present falling off in the returns of dressed ore; however, we are gradually, but surely, recovering a proper position underground. The sett is a most valuable property, and from every indication, to my mind, as well as the expressed opinion of every practical man who has examined the mine, it can, in the course of proper development be soon brought to be more productive than it has ever been. In order to carry out a regular system of mining, and give the ground proper trials, we have during the last six months continued the explorations specially referred to and recommended to previous meetings.—No. 2 Shaft, Middle Lode: Barton's cross-cut north from the 52 west was extended 2½ fms., at which point we intersected the north wall of the north lode, and are now satisfied that we are now through it. We also cross-cut south from the same level, about 15 fathoms west of this shaft, towards the middle lode, which prior to 1864 was very productive of ore from surface down to the 40. This lode we reached in about 3 fms. drivage; it proved to be 4 ft. wide, composed of calcareous spar, carbonate of lime, and small ribs of lead ore, and is a very promising lode; however, looking to the westward dip of every shoot of ore in the mine, we did not drive on the course of the lode from that point, but commenced another cross-cut 30 fms. still further west from the same level. This is in 2½ fms.; the ground is most congenial for lead ore, and I expect soon to discover the lost run of the ore ground of this lode, which has not been seen for nearly nine years.

An approximate sketch of the run and crossings of the three lodes of the mine was exhibited to the meeting. The lodes dip north, although not equally fast. The figures indicate shafts:—No. 1 is 35 fms. deep; No. 2, 52 fms.; No. 3, 101 fms., and No. 4, 13 fathoms. This sketch is given to show you the importance of a trial known as Balcombe's cross cut. This was started about eighteen months ago, and persistently continued south month by month through the north lode (hitherto proved to be 7 fms. wide) from the 84 fms. level of our main or No. 3 shaft. Every foot of this cross-cut is in a lode consisting of ribs of carbonate of lime, killas, and quartz, spotted with lead ore. There is more water coming from the present forebreast than usual, and it is my opinion that a junction of all the lodes takes place at this point and at this depth. In my report of April 17, 1872, I referred to a loose joint and the tapping of an enormous body of water in the then end of this cross-cut, and said that by degrees such was draining the No. 2 shaft on the middle lode. This joint contained a good leader of ore, and subsequently we cut another equally good branch, yet they have not influenced us to divert the drivage or alter our determination to find a natural footwall to this immense lode. Hence the cross-cut has been continued without interruption, and it now measures 25 fms. 3 ft. all in lode. What may prove to be the effect of this at the sides or at a greater depth it is impossible to say. The natural effects of a junction of lodes is to disrupture the channel of ground at the point of junction, and generally to promote a large deposit of ore on one side of or just below the point of junction, and I believe we shall find such conclusion will hold good in this case.

The other workings in this shaft will be best understood by the following setting report for the month—No. 3 Shaft, North Lode: As the air is very foul in the 95 fm. level end west I stopped the driving for a time, and set the four men to stope 6 ft. high over the back of level, at 110s. per cubic fathom. The lode yields 1½ ton per fathom. Joshua's winze, under the 84 west, to six men, at 240s. per fathom, to hole into the 95. The ground is hard and spare to sink. The lode is improving, and yields 15 cwts. of silver-lead ore per fathom. The present depth of winze is 3 fms. 1 ft. below the 84. Balcombe's cross-cut, south of the 84, to two men, at 190s. per fathom. There is no change in the quality of the lode; but more water is coming from the end, and I expect the footwall is near. The length of the cross-cut is now 25 fms. 3 ft. Jones's winze, under the 62 east, to four men, at 175s. per fm. This was sunk 2 fms. 1½ ft. last month, and its depth is now 5 fms. 1 ft. About 3 fms. more sinking will hole to the back of the 73—value 15 cwts. lead ore per fathom. Jenkins' cross-cut, south from 62, east of winze, to two men, at 170s. per fathom. The lode is improving here, and I expect to reach the footwall this month; its length now is 4 fms. 2 ft. The stope over the western end of the 84 to six men, at 80s. per cubic fathom; lode yielding 1¼ ton per fathom. The stope over the same level, east of winze, to twelve men, at 60s. per cubic fathom; lode yielding 1½ ton of ore per fathom. The stope over and close to the western end of the 73 to six men, at 75s. per cubic fathom, also worth 1¼ ton of ore per fathom. The stope over the same level, west of the masonry arch, to six men, at 75s. per cubic fathom; lode yielding 1¼ ton per fathom. The tribute pitch over the 52 east to four men, at 170s. per ton of clean ore, the takers to pay all cost, including dressing.—No. 2 Shaft, Middle Lode: Lloyd's cross cut, south from the 52, west of shaft, to two men, at 170s. per fathom. Our surface water is still very short, and we cannot crush more than six hours a day. The machinery is in first rate order. —JOHN DAVIS.

After resolutions adopting the accounts and report, complimentary votes were passed to the Chairman and managing director, and the meeting separated.

EAST POOL MINING COMPANY.—At a meeting of adventurers, held at the mine on Monday, the accounts for April and May showed a credit balance of 86l. 7s. In reference to a communication from Wheal Agar adventurers through Mr. Waddington, addressed to Capt. Garby, threatening to tap the dams in Wheal Agar sett, a resolution, moved by the Chairman, and seconded by Mr. H. P. Vivian, was unanimously passed, approving of a letter being sent as their answer to Mr. Waddington, of which the following is a copy:—"Having this day, at the meeting of our shareholders, submitted for their consideration and decision the matter contained in your letters of the 3rd and 5th inst., addressed to Capt. Garby, we are authorised to inform you that as soon as Wheal Agar is in a position to commence the drawing of its water the adventurers in this mine will be ready and willing to enter into an arrangement, based on a fair and equitable principle, touching the pumping cost which will be involved; or if preferred the adventurers in East Pool will not object to an earlier settlement of the question, either by a personal conference or by some other mutually defined mediation. Perhaps you are not aware that east of the dams in Wheal Agar there is another at the 40 in Wheal Tehidy, keeping back by far the largest body of water, and that the taking out the dams in Wheal Agar will so weaken the one in Tehidy sett, and increase the pressure against us, that it will create a far greater risk and prejudice in the minds of the men than can now by any possibility exist. If really necessary East Pool would not object to join Wheal Agar in putting strengthening or duplicate dams." Capts. W. S. Garby (manager), J. Maynard, and J. Hosking, say—"We regret to say that our tin returns have been greatly interfered with by a serious accident to the engine, delaying its working for nine days, and causing the water to rise 2 fms. above the 160, consequently covering our best tin ground. We are pleased to inform you that we have repaired the damage, and are able to work at the 160 again."

NEW PEMBROKE.—At a meeting, held at the mine, on July 8, the accounts showed a debit balance of 1073l. 17s. 5d. Capts. F. and J. Puckey say—"During the past four months we have sold upwards of 47 tons of black tin, which has realised 3821l., being an increase on the previous four months of over 11½ tons, and sold copper ore to the value of 191l.—together, equal to 4012l. The prospects of the mine for tin are still very good, although, owing to the increased price of labour and coals and other materials, coupled with the reduction in the tin standard, we have sustained a small loss on the present four months' working, yet we are still of opinion that, when the western part of the mine is more fully developed, we shall meet with some discoveries of mineral, which, added to our present returns, would soon enable us to resume dividends."

ENGLEFIELD COLLIERY.—At the first general meeting, held in accordance with the provisions of the Joint Stock Companies Acts, the Chairman reported that he had personally inspected the mine, and explained to the meeting that the works were progressing very satisfactorily, under the supervision of Mr. Cottingham, the company's engineer; and the directors were in expectation by Christmas of being enabled to obtain a large output of coal daily.

'For remainder of Meetings see to-day's Journal.]

ROOKHOPE VALLEY—SPECIAL REPORT.

July 12.—On Tuesday last I inspected the surface and underground works by appointment, and beg to give you the following particulars. The engine-shaft is sunk to the 40 fm. level, and a cross-cut of 6 fathoms in length driven north to Little lode. About 4 fathoms have been driven east of cross-cut, on the course of the said vein, but no trial is yet commenced west of cross-cut; as far as this lode is developed along the short distance above mentioned it shows a very considerable improvement as compared with the general appearance and results met with on the same vein in the upper levels; good orestuff was raised from it in those levels, but in the 40 fm. level the vein is 3 to 4 feet wide, the filling matter being fluor-spar (of that nice pink colour which characterises the highly productive lodes of the district) and solid lead ore in remunerative quantities. The 40 fm. level end east is now worth 25l. per fathom, the lode having steadily improved from shaft eastwards, and will no doubt continue to do so all the way to the junction with the great lode, which takes place some 10 fathoms east of present end; this level is being pushed forward by eight men, and when the appliance now to be adopted for sending air into the end is set to work fair progress will be made. The cross-cut is being extended north of Little lode to intersect the Big lode, and judging from the great flow of water, cross-branches of spar, and other indications now visible, I am of opinion that a great lode will in due course be cut into, and also found under much improved conditions, and consequently more productive than at shallower depths. It is, in my opinion, a great thing to see the fluor-spar, which forms the matrix of the veins, changing from a milky white colour to that of a deep pink as depth is reached. The great deposits of lead in Mr. Beaumont's mines, adjoining, are invariably attended by this deep-coloured gangue, and no where is a more decided change in this respect noticeable than in the present bottom of your mine. I feel assured that good results will be met with here shortly. In the 25 fm. level east the drivage is being made just over the top of a small plate or shale bed, and, therefore, comparatively little ore is met with. I should continue driving along the said bed for the sake of speed, and when the end is communicated to the winze coming down from the 15 fm. level the long piece of orey ground in the said 25 fm. level will be ventilated, when the vein can be stripped to full width, and stoped west from the winze as well as from rises, which no doubt you will put up at convenient distances along the level. As I said before, very little ore could be expected immediately adjoining the shale bed, but when you in stoping get above the roof of the drivage you will, I think, find a productive lode more or less of (say) 10 feet above the 25 to the 15 fm. level. You have some 150 fathoms in length of unwrought ore ground between the above-mentioned winze and the end of the old stopes coming from the engine-shaft at the 25 fm. level. The winze in question is now down about 3 fathoms below the 15, and is being sunk in the heart of a wide orey lode of a bunchy character; both sides as well as the ends of the winze show bunches of solid ore, and it is very evident that considerable width of veinstuff containing ore is standing on either side of the sink at this point. I feel persuaded that this great lode will in depth show more strength than ever, and that when the 40 and subsequent levels are brought up from the engine-shaft a change in the composition of the lode as great as that described at the engine-shaft on Little lode will be seen here also, and Rookhope become a profitable mine. The stopes in the back of the 15 fm. level are yielding on the average 1½ ton of lead ore per fathom, and paying well, the ground being soft. There are 400 cubic fathoms of ore ground standing between present stopes and the east end of the said 15 fm. level, and calculating the value at 16l. per fathom, there is a reserve there of 6400l. The ore ground, as stated above, the long run of orey ground unwrought in the 25 fm. level, together with what is now seen, and what is to be seen at the 40 when the Great Red lode is laid open by the cross-cut, perfectly justify my telling you that if the mine is not made to pay, it ought to be. I would further remark that, seeing the rich ore in the 40, you should no longer delay putting up additional power for pumping and winding. The shaft should be deepened forthwith, and the sinking continued from level to level in due course, if the company would make the most of things, and be successful. But a new engine must be erected to make your way straight in this respect, and I would advise the purchase of the 36 in. machine offered by the West Fedw Mining Company, which is suitable, and has gear for pumping and winding. The said offer also includes a Cornish boiler of 10 tons in good condition. The dressing machinery is, with the small supply of water you have, unsuitable for the place, and should be removed for the ordinary machine jiggers—*i.e.*, like those at Roman Gravels and Tankerville. About six of those machines should be sufficient for present purposes, and could be erected in a very short time.—Brandon Walls: This part of the company's property is being brought into working order speedily, for it is expected the mine will be drained of water to the 60 or bottom level in course of the next week or two. The machinery at surface—42-ft. pumping-wheel with winding and crushing gear attached, will all be in working order shortly. From the reports I have heard about this old mine, it is likely that it will be a source of profit to the company.—ARTHUR WATERS.

DRAKE WALLS—SPECIAL REPORT.

This mine is situated on the western side of the Tamar river, and has been worked for a period of more than 200 years, and has yielded enormous quantities of tin ore. My personal examination of the underground and surface operations for the last 16 years, in discharge of my duties as Mineral Agent to the Duchy of Cornwall, enables me to speak with confidence on its present state and prospects. I shall proceed without further preface to describe the different points of operation:—

BETTLEY'S SHAFT: This part of the mine is sunk to the 102, on the main lode, which has continued large and very productive for the whole distance from surface, and is of equal value now; the ground, however, has not been stoped below the 90, as from the wretched state of the pitwork and chokeage in the adit, the late company were unable to keep out the water. The pitwork, however, having now been remodelled, and the adit cleared by the present proprietors, the water will be easily drained as soon as the repairs to the engine are completed, when the ground below the 90 will at once be available for returns, and the sinking below the 102 can be resumed, with great prospects of the lode improving in depth. It is important to note that the alterations in progress will effect a saving of more than half of the previous cost.

MATTHEW'S SHAFT is situated east of and contiguous to Bettley's, and for a considerable time very large returns of tin were raised from this part alone, until by the insufficiency and bad state of the machinery the water rose above the bottom workings. The mine here is worked to the 100, and as the lode maintains its size and character, and the tin of a much richer quality than in the upper levels, immediate sinking is warranted, with every prospect of the lode becoming richer in depth. The ground to the east of Matthew's is standing whole from the bottom to surface, and from the different stopes almost any quantity of tinstuff can be raised at a good profit.

BRENTON'S SHAFT: This is immediately west of Bettley's: the workings are carried down to the 80, and very large quantities of tin have been sold therefrom, but I unhesitatingly affirm that a much larger quantity ought to have been and can now be made at once by more energetic working. The stopes west of Brenton's stand high and dry from surface to the 80, and is apparently one continuous run of profitable ground to the western boundary. Recently a side lode has been discovered 4 or 5 fms. south (dipping north towards the main lode), which has given large returns of tin, and it is equally as good now, and I believe better, than when first intersected. Seeing, therefore, that these lodes both maintain their size and value from the surface to the present bottom, with improving quality tin ore, great discoveries of tin may be expected at the junction, which should be reached in 20 or 30 fms. further sinking. In the north ground four lodes have been intersected by a cross-cut driven at the 70 from the main lode, each of which are mineral bearing, and of a very promising nature; on one of them only a little work was done, and about 800l. worth of copper ore raised, when the operations were suspended, as there was not any ventilation, the air being forced in by a machine until a new shaft could be sunk for their full development, which they well deserve. Indeed, I have not any doubt of the lodes in this part of the mine proving very productive and profitable in their development.

The geological position of the mine is essentially similar to that of Dolcoath, Tincroft, Carn Brea, and other rich mines of the county, there being a fine elvan and cross-course, and it being close to the junction of granite and killas, in which the lodes are generally large and continuously productive. Until within the last seven years most of the tinstone was crushed by rolls, much of the tin being left in the waste: this waste has accumulated for the last 200 years, therefore there are several hundred thousands of tons on the surface that will pay well to be stamped over. The mine has three steam-engines of good power, and four water-wheels (two of

them of large size), and 90 heads of stamps erected within the last seven years, all of which with repairs can be at once turned to account to make large sales of ore.

From the foregoing, therefore, it will be seen that to my knowledge there is a valuable mine underground already laid open to be worked, and also on surface from waste heaps, from which hundreds of tons of black tin can be dressed, and which warrant the erection of 100 more heads of stamps. When these are erected, and all the machinery in full work, I venture to say that there will not likely be a better mine than Drake Walls in the county of Cornwall. JOHN SIMMONS.

Duchy of Cornwall Office, Liskeard, March 12.

MINERAL DISCOVERY.—A "Miner" writes—"A rich silver lead-bearing lode has recently been discovered at a place called Poolvash, situated in the south of the Isle of Man. A short time ago the owners of this property made some temporary explorations near the sea shore, and the result of these trials were highly satisfactory. One part of the lode is composed of gossan charged with rich silver-lead ore, and proved by actual assay to contain upwards of 40 ozs. of silver to the ton. Within the last few days the lode has been traced crossing the country in a northern direction, and the indications at this point are also of a most pleasing description. All the trials in question have not exceeded 4 ft. from the surface, and the length opened on the range of the lode is over ¼ of a mile. It must be gratifying to those concerned that rich silver ore has been discovered throughout the entire distance. In judging from the geological formation of the locality, it is the opinion of high authority, and men of vast experience, that a mine of unbounded wealth exists."—*Isle of Man Times.*

CORNISH MINE SHARE MARKET.—The Market continues in a very depressed state, things indeed are quite at a standstill, and scarcely any business has been transacted during the past week. The continuous and rapid reductions which have been made in the tin standards, with the exaggerated rumours which have been freely circulated in reference to the importations of Australian tin, have made investors exceeding y cautious about buying good tin stock, and the circulars debiting shareholders in non-paying mines regularly with, in some cases, heavy calls, has almost put a quietus on business in call-making mines. So many "small men" have burnt their fingers recently in mining speculation, and lawyers' clerks and others in similar situations have taken up such considerable numbers of shares in some of the new mines, fully confident that they were going to sell immediately after at high premiums (whereas such have never been reached), that when the calls have been made they have found themselves unable to pay them, and there being, probably, little or no market for the shares they are obliged to relinquish, and thus many concerns, many of which would possibly turn out some of the best in the county, and would supply the deficiency caused by the falling off in good mines in years to come, have been abandoned without anything like a trial. East Treleigh Wood, one of this class, which was sold a few months since for 50*l.* to Capt. Tregay, seems likely to prove a profitable concern if fairly prosecuted. On all sides good reports of the mine are heard, and it is said that they are working on one of the best lodes discovered in the county at an equally shallow depth.

If the present dull time can be tided over the chances are that we shall hear of more dividend-paying mines than at present exist. The most recent rumours circulated in reference to the Australian tin are of a somewhat more favourable character. It is said that the mines are not paying, that many are already "shut up," and others very nearly approaching to it, and that the tin which has been sent home is what has been accumulated during the wet season, and that as the dry weather comes on the quantities will considerably fall off. Other rumours are, however, to the effect that there is any amount of tin in the country, and that 200 tons a week could be sent home at very little expense of freight. Which of these is correct time will prove, but generally when there is any rapid reduction or advance before much time elapses a reaction takes place. Things must find their level, and it is to be hoped that ere long we shall see a good rise in tin, and a corresponding advance in the price of shares.

The following are the closing prices:—Carn Brea, 90 to 95, several sellers at the latter price, but buyers are very shy. Cook's Kitchen remain at 19 to 19½, and a slight business has been done in shares. Dolcoath, 53 to 53½, and a few transactions reported. East Basset, 10 to 12; East Pool, 9 to 10; East Lovell, 16 to 17; Great Wheal Vor quiet, 5 to 5¼. New Rosewarne, 1½ to 2; the meeting is due to be held shortly, and it is rumoured that a call will be necessary, after paying cost for the past two quarters. New Cook's Kitchen, 1¼ to 1½; Providence dull at 9 to 9½; Rosewall Hill, 10s. to 15s.; South Carn Brea, 3½ to 3¾, and not much dealt in; South Condurrow, 6 to 6¼; South Crofty, 48 to 50, quiet. South Dolcoath, 7½ to 7¾; the meeting was held on Wednesday, when a call was made of 25s. per share. South Frances, 12 to 12½; Tincroft, 52 to 52½, and a little business done. Unity Wood, 22s. to 24; West Basset, 9½ to 9¾. West Chiverton, 8¾ to 9¼, but scarce any business in the Cornish market; it is said that they have cut a good lode in the 140 end, and this looks well for the future, being at so deep a point. West Frances, 12 to 13, quiet. West Seton slightly enquired for at 58 to 60. West Tolgus, 35 to 37; Wheal Kitty (St. Agnes), 14 to 14½, rather quiet; Wheal Basset, 55 to 57; Wheal Margaret, 5½ to 6; Wheal Seton, 46 to 48; Wheal Uny. 3 to 3½. Wheal Osborne shares can scarcely be given away, although the mine is thought by many to be a very good one if carried out; at the meeting to-day (Thursday) a call of 1*l.* per share will probably be made. New Seton weaker, at 20s. to 25s.; a few months since these shares were 35*l.*, and above. Old Treburgett, 15s. to 16s.; Herodsfoot a shade firmer, at 7 to 8; North Crofty flat, at 8s. to 9s.; South Caradon are no better than 150 to 155; North Roskear offered at 4 to 5; Cargoll, 2 to 2½; Wheal Peevor, 1¼ to 2; North Rosewarne, 1½ to 2; Wheal Agar, 14s. to 15s. The "bears" are doing their best to knock down every description of shares, and appear to be pretty successful in their efforts; some of them do not hesitate to say that a still farther reduction is inevitable. We shall see whether they foretell correctly. Of course, in the absence of the public as buyers, needy sellers must put up with any price that can be obtained, no matter at what sacrifice. —*West Briton.*

THE TRUE RELATIONS BETWEEN MINERS AND SMELTERS.

THE CONCENTRATION OF SILVER-LEAD ORES, AND ITS FUTURE BEARING ON THE PROSPECTS OF THE TERRITORY.

SIR,—In compliance with your request, I have the pleasure to give you my views as to what is necessary to be done in order to make Utah prosperous so far as the development of its mineral resources is concerned. In the present letter I shall confine myself to a theory on the subject, and leave suggestions regarding the practical methods to be adopted for a future communication.

In most countries where extensive mining has brought about competition among smelters of ores, the owners of mines have found it more advantageous to sell their ore than attempt to smelt it themselves, because they cannot compete with the former. The cause of this is evident—the smelter works on a large scale, and his current expenses are subdivided among his many furnaces, and, consequently, he can work at much less cost than the miner; besides this, the smelter collects ores for his furnaces from many districts, and by so doing provides himself with ores that flux each other, whilst the miner, as a general rule, is forced to purchase fluxes, as he can rarely count upon any other ores than those supplied by his own mine. The miner almost always is compelled to place his furnace contiguous to his mine, whereas the smelter locates his furnace at some central point where he can count upon quantity as well as quality. This is the true source of competition between the miner and the smelter, and it is, therefore, manifest that ere long the miners of Utah will abandon the idea of smelting their own ores.

Competition among the smelting companies in the Territory has already commenced to show itself, and the moment the miner can by sale realise a fair price for his ore he will give up smelting on his own account; and having gotten rid of this bugbear, he will naturally devote his best energies toward obtaining the highest possible price for his ores. This consideration will naturally cause him to investigate the principles involved in the concentration of ores, as by that process, when properly applied, he can realise double or treble the value of his better class ores, besides making marketable his low grade ores, which would otherwise be thrown out on the dump. The richness of a mine consists in the large quantities of low-grade ores, and not in the hatsful of high-grade ores. No mine can be called rich that depends only on its better class ores, for they are like angels' vi-its "few and far between." Those mines in Europe which pay the highest dividends derive their profit from the masses of their low-grade ores.

How important, then, is it to the miner not to neglect the concentration of his ores, for on it depends his success or non-success; it is the one thing needful, as proven by years of patient experience in older mining countries. Concentrated ore will not only fetch double or treble its value in consequence of the increase of percentage of the metals, but having got rid through concentration of all quartz and earthy gangue, the smelter can then afford to pay higher prices still for ore that requires comparatively no fluxes. Another important fact connected with the concentration of ores is, that after undergoing such manipulation they are only subject to one process in reverberatory furnaces, which require no other fuel but mineral coal, thereby saving the smelter great cost in fuel, and producing bar-lead in one operation. In my next I will give some statistics upon the concentration of ores in Europe, with a description of the most successful method, and the kinds of machinery used, and my views based on personal experience as to the treatment most applicable to the ores of this Territory. HENRY SEWELL.

—*Salt Lake Tribune*, June 28.

THE HUSTLER'S GOLD MINING COMPANIES.—The Sandhurst Correspondent of the *Australasian* (Dec. 28) writes—"The past week may justly be termed the 'golden week' of Bendigo, for so much gold was never exhibited on a Saturday night previously since quartz reefs were first opened in this district. The amount of gold exhibited and made public was no less than 19,009 ozs. 4 dwts. 16 grs., with 2268 ozs. of amalgam; and the amount distributed in dividends from all parts of Bendigo is 49,456*l.* 10s. 6d., while the calls were only 4900*l.*, leaving a balance of profits of 44,556*l.* 10s. 6d., and besides all this it is known that a large amount was sent in by private hands, which will only appear in the monthly purchases. Such results as this are sufficient to establish every confidence in the profitable nature of quartz reefing, as far as Sandhurst is concerned. It must also be apparent to the observer that as each year rolls by we are getting better results. The question must naturally arise—are these results obtained from newly-worked claims or those that have been working for years? This question can be met at once with the reply that all our best returns the past few months are from the latter, and obtained at great depths—say, from 400 ft. down to 700 ft., thus proving that the further we sink the stone is proved more permanent and payable; and before the close of next year it is believed that some of our claims will have their works opened to a depth of close on 1000 ft. The principal lines of reef that have contributed to the gold up to date are the Hustler's, New Chum, and Victoria, Garden Gully, and Stafford Reef, while the Carshalton have added their quota in a very respectable amount. The Great Extended Hustler's have sent in altogether 27,462 ozs. 8 dwts., paying in dividends 87,500*l.*, their return this week being largest. The manager gives a full and satisfactory report of the mine throughout, and it would appear therefrom that they have yet 170 ft. to go north to the boundary of the Great Hustler's Company at the same level from which the latter are obtaining such good stone, and the reef is 20 feet wide, which may give a large amount of gold. The Great Extended Hustler's Tribune sent in close on 500 ozs. of amalgam from the ripples only for the week, and up to the present they have produced this year the enormous yield of 46,272 ozs. 15 dwts., paying in the same time no less than 151,900*l.* making, with the company, from this hill alone, within 650 yards of ground, the sum of 239,400*l.*; north of them (the Great Hustler's Company, late Latham, and Watson's) have come upon the good run, and are now producing much more payable results; they will pay a dividend to-night or to-morrow; had they only a good shaft and more powerful machinery, they would have much better returns, for the mine is now well opened and looks well. Latham and Watson's Tribune No. 1 are also looking much more promising. The Imperial Hustler's, Royal Hustler's, and Hustler's Reserve, are all pushing their work with energy, and will report something satisfactory before long."

THE BUCKINGHAM PLUMBAGO COMPANY, CANADA.

Reference was made in last week's *Mining Journal* to the formation of a company with a capital of 150,000*l.*, in shares of 10*l.* each, for developing some extraordinarily rich plumbago mines and quarries at Buckingham, about 18 miles from Ottawa, the capital of the Dominion of Canada. The prospectus states that the property is 1250 acres in extent, of which 915 acres are held in fee simple, and the remaining 335 acres under grants of mining rights in perpetuity free of rent or royalty. The Buckingham Mines, which are believed to be the richest plumbago mines in the world, having hitherto been worked by private parties, are now developed so far as to necessitate a large basis of capital and management. In the prospectus of the company a letter was inserted from the Patent Plumbago Crucible Company of Battersea, which most men of business would regard as but little short of an absolute order for 1000 tons; it seems, however, that the insertion of the letter in the prospectus has given offence, for in the *Times* City Article of the 15th inst. the following letter appeared from the Patent Plumbago Crucible Company:—

BUCKINGHAM PLUMBAGO COMPANY.

SIR,—Our attention has been called to the prospectus of this company, in which our name is given some prominence. To prevent misapprehension, we desire to place on record that the letter published therein was addressed to Mr. Thomas Harvey, and the object of our enquiry was to ascertain, previous to more costly experiments, whether, in case the article proved suitable, a reasonable supply could be obtained. At present we are quite unable to give any opinion as to its suitability for the purpose of our manufacture.

Battersea Works, July 11. THE PATENT PLUMBAGO CRUCIBLE COMPANY.

Whether the publication of the letter in the Buckingham Plumbago's Company's prospectus was justified it is not necessary to discuss, but it is beyond question that the Crucible Company's letter was a *bonâ fide* business communication, intended to facilitate the closing of the contract, hence the letter of the secretary of the Buckingham Company to the *Times*:—

SIR,—In reference to the letter of the Patent Plumbago Crucible Company in your City Article of to-day's *Times*, I am instructed to state that, though the directors had ample evidence of the purity of the plumbago from these mines, they inserted in the prospectus a portion of the Crucible Company's letter (written by that company spontaneously) merely in corroboration of the former assays, and to show that a considerable demand for the article exists here, though, as is well known, the market in America is very much larger, and the prices rule higher. Annexed is a full copy of the Crucible Company's letter referred to, which the directors regarded as a *bonâ fide* offer in the ordinary way of business, and from which they could only assume that the plumbago from these mines was suitable for the purposes of that company. GEO. J. GRAY, Secretary.

The Buckingham Plumbago Company, Limited, St. Clement's House, Clement's-lane, London, E.C., July 15.

The unabridged letter of the Crucible Company is subjoined:—

Battersea Works, London, S.W., Feb. 12

SIR,—We find the specimen you gave us contains between 94 and 95 per cent. of pure plumbago, and shall be obliged by your informing us at what price you can deliver at these works 1000 tons of similar quality—say, 250 tons in April, June, August, and September.

If we can come to terms we shall be prepared to pay prompt cash, and you can enquire of Messrs. Glynn and Co. as to our position.—We are, Sir, your obedient servants, for the Patent Plumbago Crucible Company,

O. V. MORGAN.

Thos. Harvey, Esq., 27, Clement's-lane, E.C.

Now, although it may be unusual to criticise an ordinary commercial letter, there are several points in that of Mr. O. V. Morgan which it is difficult to pass by unnoticed. In the first place, it is very unusual for a purchaser to state the percentage of a chemically pure substance in a commercial sample, yet this is not difficult to account for when we consider that it has been sometimes stated that the Buckingham plumbago is absolutely pure, so that the assertion made that it assayed but from 94 to 95 per cent. would indicate that they had taken the precaution to ascertain its exact quality.

The other important point in the letter is that the Crucible Company gives the name of its bankers as guarantee for its solvency, which a purchaser merely enquiring for a price would scarcely be expected to do; however, the Crucible Company may have a peculiar mode of doing its business, but as it has long been well known to purchasers of crucibles we may hope that they may yet find that the use of the Buckingham plumbago will even add to their already high reputation.

FOREIGN MINES.

DON PEDRO NORTH DEL REY.—The produce and cost for May shows a loss of 2118*l.* 19s. 6d. Many circumstances tend to increase this month's cost: our force just now is large, provisions have much increased in price, I have purchased 200 ft. odd of 2-in. round iron for rods in case it may become necessary to replace wire-rope, at a cost of Rs. 259. The crab-winch from England has been issued to mine, and represents Rs. 740. First division of June: Produce, weighed to date, 827 oits. Remittance, 7360 oits.

ROSSA GRANDE.—May: The cost for the month, inclusive of 113*l.* 5s. 7d. charged towards the erection of the Bahu Stamping Mill, and 147. 2s. 6d. towards making the new rego, amounts to 925*l.* 16s. 1d., and the total daily average of force has been 150·9. It will be seen that after the above amounts for new work are deducted it brings the cost down to 702*l.* 8s. Gold obtained from samples, 5¼ oits. Operations in the Bahu Mine have been prosecuted with vigour during the month, and the lode may be considered to be opening out satisfactorily. Good progress is being made in erecting the Bahu Stamping Mill. The force has not been sufficient to continue driving the 20 East Cachoeira, but the rise in the back of this level has been communicated to the 10 east. First division of June: Estimate of backs laid open during April, 1873, 850 tons by 8 oits. per ton = 6800 oits. of gold.

SAN PEDRO.—R. M. Kitto. May 30: New Shaft: The 70 fm. level cross-cut, driving south of west to intersect the manto San Pedro, by four men, at 840 per metre The ground is still hard, with a stream of water flowing freely from the breast of the end. This is a good indication that we are nearing the manto. I firmly believe we shall have the best manto of ore here that has been seen anywhere below the 122 fm. level. We cut the water in this cross-cut last Saturday; it has not drained anything in the 135 yet, as soon as it does I shall begin a winze in this bottom in a lode of ore worth 12 tons of 30 per cent. ore per fathom. A stope in the back of the 128, south part of manto, will produce 5 tons of 20 per cent. ore per fathom. This stope is within 6 metres of the 122: when we get to this point we shall be obliged to drive a new side level here, as all the timbers are so rotten it will not be safe to work under them, so it will be much less expense to drive a new level than to secure and repair the old one. I pointed this out to the Government Inspector when he was here. He quite coincided with my idea. A stope in back of the 128, west part of manto, will produce 6 tons of 16 per cent. ore per fathom. A stope in back of the same level, east part of manto, will produce 2 tons of 20 per cent. ore per fathom. The stope in the back of the 122 is suspended, also the level driving south of west from the south part of manto, on account of having reduced the number of hands employed from 100 to about 50 people.—Santa Helena Mine: Since my last the tributers have given up, as they could not make wages. I have now one man employed in sinking the chiffon for roadway. This is producing good stones of ore. I am glad to state the Thomas Blythe has arrived in Chamaral, all well. I now hope to get the machinery discharged as quickly as possible, and the sooner we get it erected the better, as it is a very slow business to draw the stuff and water from a depth of 150 fms. from surface with horses. Everything here in the mine is working well, and in good order.

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada:—Hall, London.—Week's run, $45,000.—Probert.

CHONTALES.—The directors have advices from Mr. Smeddle, dated June 5, who reports—Our water supply during the past month has been very little more than sufficient to feed the stamps, and we have been compelled to depend upon steam alone; we have, there fore, only been able to reduce 1353 tons of ore, from which we have obtained 193 ozs. of gold, being an average of nearly 3 dwts. per ton. Our total cost for the month has amounted to the sum of 757*l.* We value the gold obtained at the sum of 542*l.*, leaving a debit balance of 215*l.* The above cost includes the sum of 92*l.* charged to construction account. Although the yield during the past month has been very low, yet had we been crushing with water-power we should have been able to show something to the good. The cost of firewood, and extra cost in the mill, together with the smaller quantity of quartz reduced when using steam, make it impossible to show a profit from such low class ore. We have had a few showers, and expect an increase of water during the present month, when I have no doubt we shall do better. The stone-breaker has now passed the worst part of the road, and the contractor expects to deliver it here about the 20th of this month. The lode at San Sebastian Mine has improved within the last few days, and is at present 4 ft. 6 in. wide, and worth about 4 dwts. per ton. I have great faith in this mine, and believe that it will continue to improve, as we are fast approaching a point directly under the native workings. I have also set a contract for extending the tramway to Estrella and Consuelo Mines during the dry season. The health of the establishment continues good.

Daniel Tonkin, June 5: Herewith I beg to hand you my report of the mine for May.—East San Benito Mine: The stope in back of No. 2 level, west of cross-cut, has yielded 431 tons of quartz, from a lode 2½ ft. wide, worth 3 dwts. of gold per ton. We have also put up a rise in back of the bottom level 10½ varas, and drove a cross-cut 18 varas to communicate with the same.—Santo Domingo Mine: The stope in back of No. 1 level, east of cross cut, has produced 577 tons of quartz, from a lode 6 ft. wide, worth 2 dwts. of gold per ton. No. 3 level, west of cross-cut, has been driven 19½ varas, on a lode 6 ft. wide, worth 2½ dwts. of gold per ton. The No. 3 level, east of cross-cut, has been driven 10½ varas, on a lode 4 ft. wide, with a little gold, but generally poor.—San Sebastian Mine: The main level has been driven 19½ varas, and the lode has been in a disordered state, but is much better at present; the yield per ton has been 3½ dwts. The quantity of quartz sent to the stamps is as follows:—From East San Benito Mine, 431 tons, yielding 3 dwts. of gold per ton; from Santo Domingo Mine, 803 tons, yielding 3½ dwts. of gold per ton; from San Sebastian Mine, 83 tons, yielding 3½ dwts. of gold per ton; from Trinidad Heap, 36 tons, yielding 3½ dwts. of gold per ton: in all, 1353 tons 193·600 ozs. of melted gold.

WINAMUCK.—Telegram: June proceeds $22,864·91; net $4858·[illegible]. Nine days' proceeds (July), one furnace, $6000.—Both furnaces were shut down during part of June, one of them after a run of 75 days. The completed [illegible] received for May show gross production $90,611·70; net $65,430·14.

JAVALL.—Capt. Sohns, June 7: The wet season had set in, and [illegible] manager expected to commence running the mill about June 16. Everything being pushed forward in connection with the new stamps, machinery, and engine.

SERVIAN COPPER AND IRON COMPANY.—Brenton Symons, July [illegible]: We have progressed somewhat better the past week, the weather having improved. At Casnitza the water-course is brought to the wheel, which is getting on rapidly. I have some hope of starting on Saturday next to fork the water, should the weather remain fine. The works at Maidanpek are being pushed rapidly forward. We have completed store for 3500 mass of charcoal, and have in progress another to hold 6000 mass. The ore depôt is completed, as also the roasting ovens, and next week we shall commence to roast in them. In the mines no change to report. Sinking at Bakarnitza goes on well; we have commenced to run for black copper, having about 110 tons of rich mattes, averaging 23 per cent. to smelt. Our exploring party has discovered some copper ore east of Staritza. To-day is our sampling.

THORNHILL REEF.—May 20: Machinery: The stamps are still at work, but owing to stoppages we cannot crush more than 75 tons weekly: this is a great drawback, as we could put through 200 tons weekly with little extra cost if we had more stamps. The stamps that I am getting out from Messrs. Harvey's are not ordered for the Thornhill Reef Company, as I quite understand all orders sent to England should go through the directors, I placed myself in this position intentionally, so that when the stamps arrive here, if experience has proved them to be all right, I can appropriate one or two batteries to Thornhill: and if on the contrary, they do not continue a success, the company will not be bound to take the stamps, as they would be had the directors ordered them. I must very soon begin to erect the large engine, as we are still crushing with the hired portable at a great disadvantage: I only started this way to give you some idea of the value of the mine, as we had been delayed so long.—Mine: There is no change, the stone being sometimes better and sometimes worse, which is always the case, and know that this would be so I wrote you that I would in future report the yield monthly. We have since received your telegram to report weekly. Up to the present time we have crushed 500 tons of stone for 335 ozs. of gold, which seems to be a fair average of the stuff, so far as it has been taken from the three levels—200, 450, and 300 ft. The gold is not yet smelted, but is in the bank.

NEW ROSARIO.—Report for June: M. V. Cumins, Superintendent of the Mines: The lode in the Providencia continues to look well, and the ore we are raising is yielding an average of 12½ to 13 marcs, which is as good as ever obtained from the Carratera. I find that I have done well in placing an Englishman in the shaft, as there is more work done, and by attention being given to the drilling of the holes to their proper depth more stuff is broken.—Rosario Mine: The Victoria winze is sunk to a depth of about 33 varas. The men have completed the planking, and will commence on Monday to drive a level south, having the Rosario lode. Enclosed please to find a copy of the boleta received from the hacienda. The silver extracted amounts to 217 marcs, worth at the Mexican [illegible] $1953 (390*l.* 12s.) As soon as I have the silver from 400 cargas the whole will be shipped to Edgland.

BUNKER HILL (California).—W. L. Palmer, June 24: The [illegible] lopments in the mine continue to be of the most favourable character. From the 70 ft. level, in our former workings, we took out $150,000 worth from a section about 300 ft. in length by 7½ ft. in thickness—other points yielded well. But our present explorations prove the vein to be over 100 ft. thick at that point instead of 7½ ft. The vast body of ore in this level is, therefore, untouched, and some of it proves to be richer than the former yield, much of which went as high as $60 per ton. This body we intend keeping as a reserve. The 150 body of ore widens as we push the work forward; this is a fine body of ore. The 200 is improving, but our best ore is now coming out of the 270, which is our deepest drift. The shaft is down 430 ft., and in good pay ore clear to the bottom. The body of ore from the 270 to the surface is a very splendid mass of ore; it is 60 ft. long, 100 ft. and over in width, and 270 ft. in depth, and extending far beyond our present works. No mine in the county has paid better for the depth worked to ours, and appearances indicate that we have as good a mine, if not better, than the Hayward-Amador or Keystone, which have paid so largely. From the 270 to the surface we have abundance of ore, and it is now only a question of additional stamping-power, which we greatly need. Ore still yields in the mill as good as ever—$19 ·50, and it is worked for $5. We have ore that will yield more than twice this amount, which we will work later on.

BENSBERG.—J. W. Hoffman, July 12: We re-commenced sinking the Victoria shaft this week, and have made about 1 ft. progress; most of the time was taken up in securing the bottom timbers, which had been washed loose by the continuous flow of water, and lengthening the suction pipes of the pumps. The small pumps which is nearest the bottom keeps down the water easily, pumping into the water cistern 20 ft. above the surface, which makes the total depth 84 ft. We are dressing the heaps of slimes which are lying about with the machines, as the steam lift does not work satisfactorily, and we have no other means of lifting the rock ore. The slimes need not be lifted, but enter the machinery on the ground floor. The steam lift has been sent back to the machine makers to be altered, and will be ready in a few days. Production of carbonate for the week, 10 tons 32 per cent.; delivered 50 tons of 32 per cent.; production of rock ore, 10 tons 10 per cent.

[For remainder of Foreign Mines, see to-day's Journal.]

COLORADO.—There was an exhibition here of silver bricks from [illegible] week's run of the mines, when those from the Caribou weighed 833 lbs.; value $12,500. They were for the Mining Company Nederland, represented in this country by Capt. M. A. Shaffenburg, their esteemed and efficient Colorado director. He and they can well be proud of its productiveness as a Colorado mine, compared to any of the boasted best in Utah or the Pacific States.—*Rocky Mountain News.*

MINING IN UTAH.—The Mono Mine, of Dry Canyon, is to be incorporated for $3,000,000, and placed on the San Francisco market. There is no doubt that the Mono is able to pay interest on that large sum, as an immense quantity of ore is in sight, while the first-grade ore is increasing in quantity. The Mono was discovered Nov. 12, 1871, and in March, 1872, work was fairly begun on it. In April ore was struck, and since then the mine has yielded richly. M. T. Gibbs and O. Embody were the original locators, and have now gone to San Francisco for the purpose of making out the necessary papers to transfer the mine to the new company. It is understood that they receive $2,000,000 coin for the property, and one-half of the stock. The work now going on is 500 ft. from the surface, on a vein 4 ft. wide, of first-class ore, and widening; this grade runs very high, some samples of a ton giving $7000, and two carloads sent away running $2000 on an average. An incalculable mass of ore of the lower grade runs from 70 to 100 ozs. of silver to the ton; this will undoubtedly be treated by the company in Utah. The shaft is now working in a very large body of mineral, and it really looks as if we shall have in Dry Canyon a second Comstock. No such body of ore has yet been struck in Utah, and we hail the splendid development of the mine as one of the brightest signs for the future; and we congratulate the new company in obtaining a property which will be certain to make Utah mines better known in the San Francisco market. The Mono will yet be a familiar name among the operators on the Pacific Coast.—*Salt Lake Daily Journal*, June 26.

It is estimated that nearly 2000 miners are delving for the precious metals in Bingham Canyon.

THE YARKAND MISSION.—News from Kulu-Punjab, by last mail, states that Yarkand Mission will not start from there, as the last did, but from Cashmere, which is more to the north. Dr. Stolitzka, of the Government Survey of India, will accompany Mr. T. Forsyth, C.B., and the Yarkland Mission. A large reef of pure crystal has been lately uncovered in Kulu, capable of providing "pebbles" for optical purposes of hitherto unheard of dimensions and great purity. There is a letter from the Emperor Aurungzebe to one of the former Rajahs of Kulu, blaming him for not sending more crystals and of better size and quality. The Emperor says he does not wish to take the mine away from the Rajah, but that he will if there is no change for the better. It was this oppression of the Kings of Delhi, under whom the Rajahs of Kulu held their territory, that eventually induced them to plant over and hide all the rich silver and other mines which were worked by forced labour, and which have only quite lately been re-discovered and are about being worked by British capital, the country being part of British India after a cessation of nearly 300 years.—*Times*, July 14.

COPPER—(Messrs. Pitcairn-Campbell and Co., Liverpool, July 15):—In spite of many features in its favour, which must tell by-and-bye, copper continues to be unfavourably influenced by the general commercial gloom which prevails, and any demand is freely met, prices showing rather a drooping tendency. As will be seen by the figures below, exports for the six months, ending June 30, show a considerable increase, whilst imports are less, and advices from West Coast, S.A., still firmly maintain the estimate of a reduced export from there of 5000 tons for the year. Supplies, too, from outside sources, such as Japan, &c., which we had last year, must also be much less. The imports into Liverpool and Swansea for the six months have been—

	Ores.	Regulus.	Barilla.	Slab.	Fine copper.	Total in
1873	23,759	12,900	342	11,481	23,407	
1872	17,895	15,969	866	14,948	27,140	
Dec.	—	3,069	524	2,467	3,742	
Inc.	5,874	—	—	—	—	

Imports into London for same period have been—1873, 7470 tons; 1872, 9946 tons; 1871, 4970 tons. According to the Board of Trade Returns, exports have been—

	1871.	1872.	1873.
English copper, wrought and unwrought	11,385	11,896	12,518
Foreign ditto, unwrought	5,644	4,368	10,769
Yellow metal	5,450	5,518	4,905
Total	22,479	21,712	28,240

Showing an increase of 6528 tons over last year, and 5761 over 1871. Quotations are 79*l.* to 81*l.* per ton for Chilian bars, and 15s. 6d. per unit for regulus. During the fortnight upwards of 3000 tons bars changed hands at from 79*l.* to 82*l.* 5s. per ton, and 200 tons regulus at Swansea at 15s. 6d. per unit, and on the 8th inst. 1710 tons ore at Swansea by tender, average produce 19¼ per cent., average price 14s. 5d. per unit. Arrivals here during the fortnight of West Coast, S.A., produce:—Araucania, from Valparaiso, 230 tons bars; Lochleven Castle, ditto, 30 tons bars; Gaelic, ditto, 230 tons regulus, 595 tons bars, 50 tons Barilla; Spirit of the Morning, ditto, 40 tons bars; Garland, ditto, 100 tons bars; Maude, ditto, 19 tons bars; Corrientes, ditto, 51 tons bars; Oruro, ditto, 15 tons bars; Maggie Trimble, ditto, 40 tons bars; Zadok, ditto, 50 tons bars; Lusitania, ditto, 1314 tons regulus, 130 tons bars; Conference, ditto, 30 tons regulus. At Swansea, Hinda, from Pan de Azucar, 685 tons regulus; Hercules, from ditto, 533 tons ores; Herradura, from Totoralillo, 720 tons regulus. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	399	823	16,060	575	40
Swansea	3239	5406	3,221	50	—
Total	3543	6229	19,281	625	40

Representing about 23,500 tons fine copper, against 15,965 tons July 15, 1872; 20,200 tons July 15, 1871; and 17,700 tons July 15, 1870.

BY ROYAL LETTERS PATENT.

H. R. MARSDEN, BLAKE MACHINE,

ONLY MAKER OF THE WELL-KNOWN

ORE CRUSHERS, WITH THE NEW PATENT CUBING JAW.

Has received 30 First-class Gold and Silver Medals.

750 NOW IN USE.

ALSO,

NEW Patent EMERY CRUSHERS,
CEMENT CRUSHERS,
MACHINES for making GRAVEL
AND
ROAD METAL.

COPROLITE CRUSHERS,
Small Handpower Machines for Crushing Samples, &c.

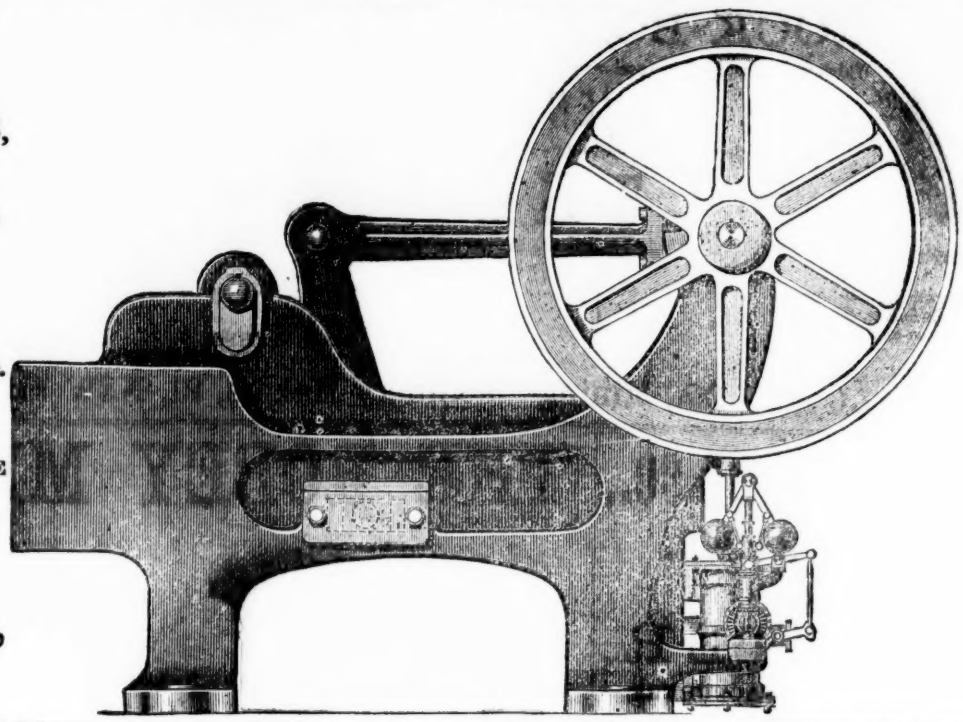
SECURES FIRST-CLASS PRIZE MEDALS WHEREVER EXHIBITED.

ARE IN USE IN ALL PARTS OF THE WORLD. IMMENSE SAVING OF LABOUR.

Users write—"It is a fascination." "A wonder." "Your Ore Crusher is all that we could desire."

For illustrated catalogues, circulars, and testimonials, apply to—

H. R. MARSDEN, Soho Foundry,
LEEDS,
ONLY MAKER IN THE UNITED KINGDOM.



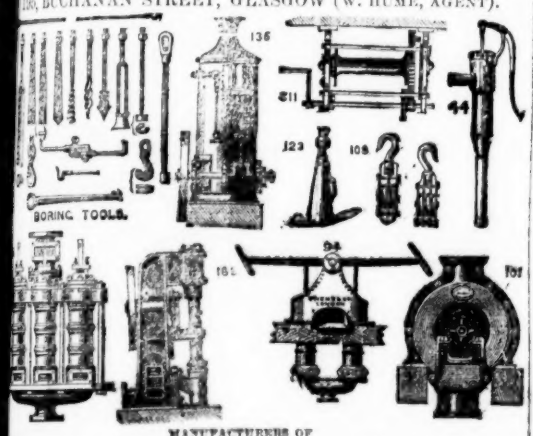
REFERENCES TO ALL PARTS OF THE WORLD.

NOW IN FULL OPERATION AT THE LONDON EXHIBITION, MACHINERY IN MOTION DEPARTMENT, Stand 4854, Class 14, Room 5.

S. OWENS AND CO.,

Hydraulic and General Engineers,

WHITEFRIARSSTREET, FLEETSTREET, LONDON
AND AT
136, BUCHANAN STREET, GLASGOW (W. HUME, AGENT).

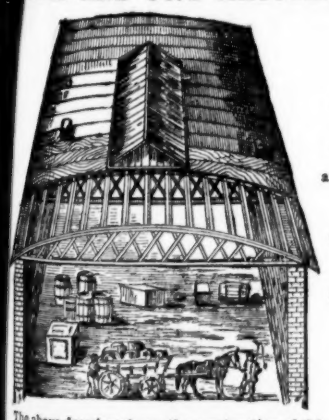


MANUFACTURERS OF

BORING TOOLS, for testing ground for Minerals. Bridge foundations, Artesian Wells, &c., to any depth.
No. 26.—Treble Barrel and other Deep Well Pumps.
No. 136.—Vertical and other Portable Steam Engines.
No. 185.—Horizontal and Vertical Steam Pumping Engines.
No. 112.—Single and Double-purchase Crab Winches.
No. 108.—Pulley Blocks of all sizes.
No. 123.—Bottle and other Lifting Jacks.
No. 94.—Double-barrel Pumps, for Mine or Quarry use.
No. 44.—Portable Wrought-iron Pumps, ditto ditto
No. 102.—Bernay's Patent Centrifugal Pumps, of all sizes.

ALSO EVERY OTHER DESCRIPTION OF
HYDRAULIC AND GENERAL MACHINERY,
COMPRISING
TURBINES, WATER WHEELS, WIND ENGINES, THE HYDRAULIC RAM, FIRE ENGINES, &c.
Catalogues and Estimates on application.

M'TEAR AND CO.'S CIRCULAR ROOFING FELT



FOR
GREAT ECONOMY
AND
CLEAR WIDE SPACE.

For particulars, estimates, and plans, address,—

M'TEAR & CO.,
0, BUDGE ROW, CANNON STREET, LONDON;
54, PORTLAND STREET, MANCHESTER;
OR
CORPORATION STREET, BELFAST.

The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheeted with ½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 45s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

INODOROUS FELT for lining damp walls and under floor cloths.

DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

Wholesale buyers and exporters allowed liberal discounts.

PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required 8d. per gallon.

ESTABLISHED 1852.

WEIGHING MACHINERY.

HODGSON & STEAD, MANUFACTURERS,

Egerton Works & Hope Foundry, Salford, Manchester.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

STANLEY'S PATENT FURNACE,

FOR SMELTING ORE OR RE-MELTING IRON OR OTHER METAL,

PUDDLING AND ALL KINDS OF HEATING FURNACES.

JOHN MARTIN STANLEY, PATENTEE & SOLE LICENSOR, SHEFFIELD.

The advantages of these furnaces are, in the first place, they effect a saving of from 25 to 50 per cent. in fuel.
2ndly, The use and expense of grate-bars are dispensed with, as these furnaces have closed fire-places, formed in brickwork.
3rdly, They make from 80 to 90 per cent. less ashes than open fire-grate furnaces.
4thly, They have a purer flame, the combustion is more complete, and contains less free or unmixed air or gases.
5thly, The workmen have much less labour in working these furnaces.
6thly, They heat quicker, and are more under the control of the furnace-men.
7thly, They are not affected by the position of the wind or draughts.
8thly, The mills and workshops are cooler and more comfortable than where the open fire-grate furnaces are used.

For prices, and other information, apply to J. M. STANLEY, 27, Change-alley, Sheffield.

THE DIAMOND DRILL.

PROSPECTING OR TRIAL BORING FOR MINERALS

The DIAMOND ROCK BORING COMPANY (LIMITED) is PREPARED to UNDERTAKE CONTRACTS at FIXED RATES for PROSPECTING or BORING for MINERALS of all kinds. Great speed is attained; work that formerly took years is done in the same number of months, and sample cores are brought up, showing the nature of the strata passed through, and enabling the minerals obtained to be analysed.

The company has a number of MACHINES in SUCCESSFUL OPERATION in different parts of ENGLAND, and the terms, with particulars, will be supplied upon application to—

THE SECRETARY, DIAMOND ROCK BORING COMPANY, LIMITED,
2. WESTMINSTER CHAMBERS. LONDON. S.W

BOLTS AND NUTS. BOLTS AND NUTS.

MADE BY PATENT MACHINERY.

Suitable for Engineers, Millwrights, Coach and Wagon Builders, Colliery, and other Purposes.

AN EXTENSINE ASSORTMENT OF OVER 200 TONS ALWAYS IN STOCK.

From which orders can be promptly executed. Every description of Bolts and Nuts made to order.

BAR IRON. BAR IRON.

OVER 1000 TONS OF BARS, PLATES, SHEETS, ANGLES, HOOPS, SQUARES, ROUNDS, AND FLATS.
All of First-class Quality.

RAILWAY, COLLIERY, AND TRAM RAILS, TO ANY SECTION.

A large Stock of Anvils, Vices, Tue Irons, Smiths' Bellows, Files, Rasps, Picks, Spades and Shovels, Sledge and Hand Hammers, Best Swedish Horse Nails, Back Bands, Plough Traces, Best Spring, Cast, Double Shear, and Blister Steel.

JOHN STANSFELD (late Stansfeld and Sons), Iron Merchants, Bolt and Nut Manufacturers,
ALFRED STREET BOAR LANE, LEEDS.

ROCK DRILLING MACHINERY.

Brydon Davidson, and Warrington's Patent.

References, particulars, Estimates, &c., Sent on application.

CHARLES BALL AND CO., lately Sole Agents for

THE BURLEIGH ROCK DRILL,

ARE NOW PREPARED TO SUPPLY THEIR NEW

ROCK-BORING MACHINE, OR "POWER JUMPER,"

Which they consider far superior to any other Rock-boring Machinery existing, and which they have, therefore, undertaken to bring before the public. The Firm's princip

"INVENTORS OF NONE—AGENTS FOR THE BEST"

Secures to its customers the best known machinery, as the Firm is entirely impartial in its adoption of any particular style of machines.

THE "POWER JUMPER"

Is recommended to the public on account of its qualities, which are the following. It is—

CHEAPER,
SIMPLER,
LIGHTER,
SHORTER,
THAN ANY OTHER.

COMPARISON INVITED.

Secondhand
BURLEIGH DRILLS
FOR SALE.

CHARLES BALL AND CO., Mining Machinery Makers, 21, NEW BRIDGE STREET, LONDON, E.C.

OSWALD BROOKE AND CO.,

51, DALE STREET,
PICCADILLY,

MANCHESTER,

PATENTEES AND SOLE MANUFACTURERS
OF

GOVERNMENT
FIREPROOF

BRATTICE CLOTH

AND

AIR TUBING.

WORKS: COLLYHURST.

McNIEL, MULLER, AND CO.,

39, MARKET STREET,
MANCHESTER,

SOLE AGENTS FOR { "S. B. HÆMATITE," "S. B. YORKSHIRE," "CLAY LANE," 'CLAY CROSS," } PIG IRON

AGENTS FOR JACKSON, GILL, AND CO., IMPERIAL IRONWORKS, NEAR MIDDLESBOROUGH;
DARLINGTON WAGON COMPANY, DARLINGTON.

SCOTCH, HÆMATITE, STAFFORDSHIRE, DERBYSHIRE, FOREST OF DEAN, COLD BLAST AND REFINED PIG IRON, PUDDLED BARS AND BAR IRON, STEEL, SPELTER, TIN, COPPER, LEAD, SHEETS, ORES, BOLTS, NUTS, SPIKES, MANUFACTURED IRON, &c., &c.

THE

RAILWAY SPRING COMPANY,

MILLSANDS, SHEFFIELD,

Having purchased from the Trustee of the late Firm of W. Charles and Co. the extensive works, with the valuable and improved machinery, are prepared to execute orders for every description of

RAILWAY SPRINGS.

HEPBURN'S
PUMP LEATHER
WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

I. AND T. HEPBURN AND SONS,

TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,

LONG LANE, SOUTHWARK, LONDON.

Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM

(DAILY), and

SOUTH WALES GAZETTE

(WEEKLY), established 1857,

The largest and most widely circulated papers in Monmouthshire and South Wales.
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the "South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.

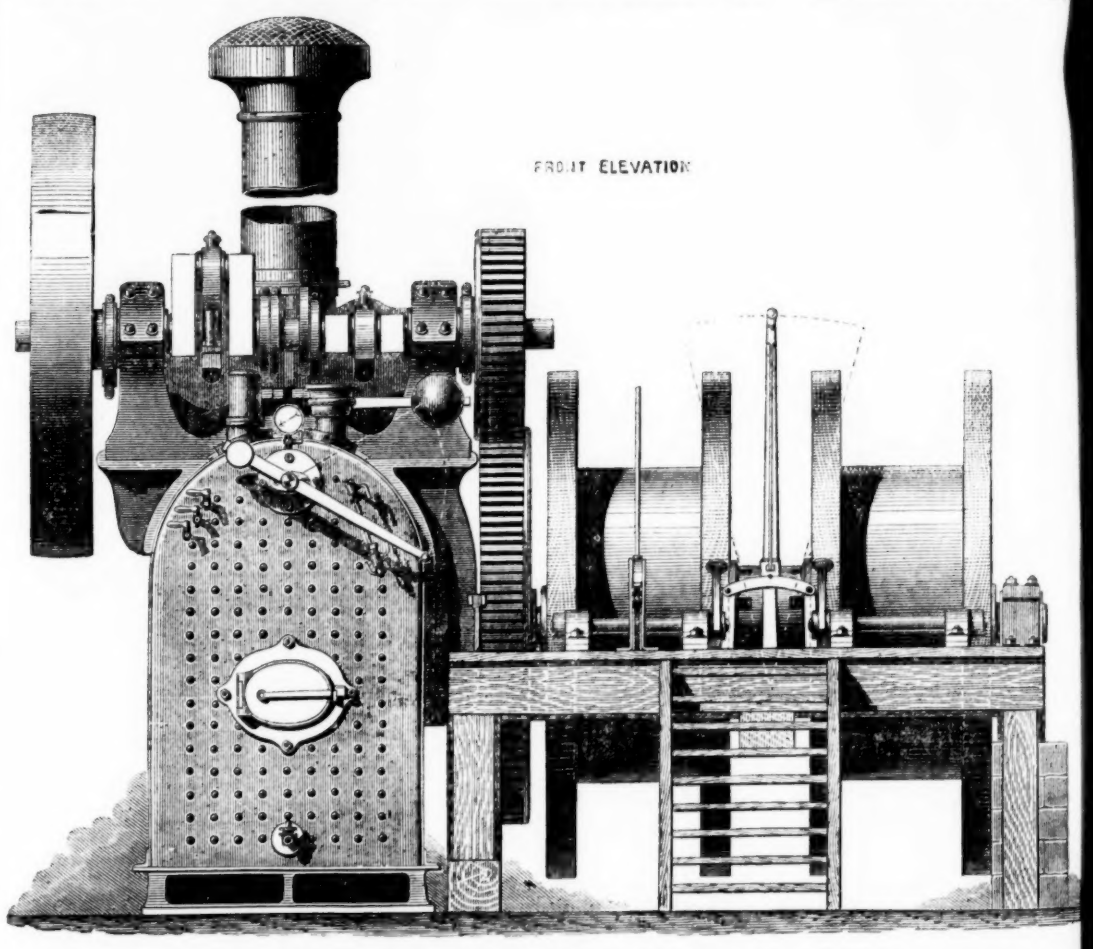
P. O. O. and cheques payable to Henry Russell Evans, 14, Commercial-street, Newport, Monmouthshire.

THE NEWCASTLE DAILY CHRONICLE,

(ESTABLISHED 1764.)

THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard-street, North Shields; 195, High-street, Sunderland.

THE ROBEY MINING ENGINE.



FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

ROBEY AND COMPANY, LIMITED,

PERSEVERANCE IRONWORKS, LINCOLN.

ALSO OF PATENT PORTABLE

HAULING & WINDING ENGINE

WITH

PATENT DRUM WINDLASSES,

FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—
Haulage along inclined drifts is easily and cheaply effected;
The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required
It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;
It can be very quickly removed (being self-propelling), and fixed in any desired position.
Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,

AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which will corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

"T. W. KEATES, F.C.S., &c. &c

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

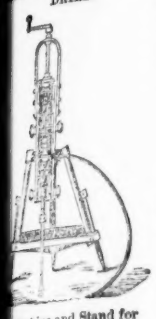
LONDON: CASTLE BAYNARD, UPPER THAMES STREET.
WORKS: MILLWALL, POPLAR; and ERITH, KENT

THE "BURLEIGH" ROCK-DRILLING MACHINERY.

THOMAS BROWN,

PATENTEE AND SOLE PROPRIETOR.

THE "BURLEIGH" ROCK DRILL.



Machine and Stand for QUARRYING and SINKING.

This celebrated ROCK DRILL, which by reason of its inherent merits has superseded all other Rock Drills, is now in extensive use in America, England, Scotland, and the Continent, and is indispensable in the economic working of all Railway Cuttings, Shafts, Quarries, and Mines.

Its prominent features are:—

I.—ITS SIMPLICITY.

Any labourer can work it, and it does not get out of order. It may be worked either by air or steam power, at will, without any alteration of the mechanism.

II.—ITS DURABILITY.

No part of the mechanism is exposed; it is all enclosed within the cylinder—so there is no risk of its being broken.

III.—ITS CAPABILITY.

In hard rock, like granite, gneiss, iron-stone, quartz, the Tunnel Drill will progress at the incredible rate of 6 inches to 12 inches per minute. These machines can bore holes from 1 inch up to 5 inches in diameter, and, on an average, will go through 120 feet of rock per day—making 40 holes each from 2 to 5 feet deep. The drill can be used at any angle, and in any direction, and will drill and clear itself to any depth up to 20 feet.

IV.—ITS ECONOMY.

As compared with hand labour the saving in actual drilling is very considerable, from the fact of the "out put" being increased tenfold. The saving in the general expenses, and in the interest of capital, will be in a like ratio.

DRILL POINTS.

The saving in steel alone is incredible, ONE DRILL POINT WILL DRILL THROUGH TWENTY FEET OF ABERDEEN GRANITE WITHOUT SHARPENING. This fact will be duly appreciated by practical men.

For testimonials, estimates, and other information, apply to—

T. BROWN & CO., Engineers, 96, Newgate-street, London, E.C.

WILSON, McLAY, & CO., Sole Agents, 2, Talbot-court, Gracechurch-street, London, E.C.; and 87, St. Vincent-street, Glasgow.

CRAVEN BROTHERS, Engineers (the Makers), Vauxhall Ironworks, Osborne-street, Manchester.

THE "BURLEIGH" AIR COMPRESSOR,

THOMAS BROWN,

PATENTEE & SOLE PROPRIETOR.

For driving the "Burleigh" Drill, or other Machinery.

The peculiar advantages which enhance the value of this Machine in the estimation of those who have it in practical use are—

1.—The pump pistons are driven by a steam-engine, the connection rods being attached to one crank shaft, the angles being so set that when the greatest power is developed in the steam cylinder the point of the greatest compression is being reached alternately in the air cylinders.

2.—The heat generated by compression of the air is reduced to *nil*.

3.—It is strong and durable compared with its effective power.

For further particulars, and all information relating thereto, please address—

T. BROWN & CO.,

ENGINEERS,

96, NEWGATE STREET, LONDON, E.C.;

WILSON, McLAY, & CO.,

SOLE AGENTS,

2, TALBOT COURT, GRACECHURCH STREET, LONDON, E.C.;

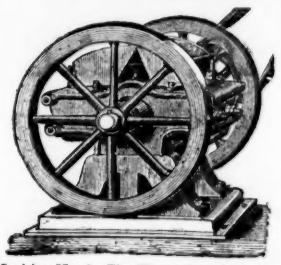
AND

87, ST. VINCENT STREET, GLASGOW.

CRAVEN BROTHERS,

THE MAKERS,

VAUXHALL IRON WORKS, OSBORNE STREET, MANCHESTER.



Machine No. 1—The Direct Double-Action.

IMPROVED

PATENT STONE BREAKING, QUARTZ CRUSHING, AND GRINDING MACHINERY.

Messrs. T. BROWN and Co., ENGINEERS, have much pleasure in calling attention to their IMPROVED MACHINERY for STONE BREAKING and QUARTZ CRUSHING, for crushing, grinding, or triturating Stone, Flint, Minerals, Ores, Chemicals, and other substances; for washing and separating Metals from Ores, and for extracting Gold from Quartz.

The principle of this invention is applied to machines of various construction, which contain within the range of their capability the power of reducing all hard materials to cubes of from 2½ inches to impalpable powder. The mechanical construction of each description of machine is specially adapted for its own peculiar work, and experience has shown that each is eminently suited for the work for which it is designed.

They can be driven by water, steam, or horse power; they are light and portable, and their crushing and grinding surfaces are so constructed that when worn they can easily be replaced.

If intending purchasers would send a sample of the materials required to be crushed or broken it could be operated upon in their presence, and thus they would be guided in the selection of the machine best suited for their requirements.

For prices, and all information relating thereto, please address—

T. BROWN & CO.,

ENGINEERS,

96, NEWGATE STREET, LONDON, E.C.

Or their representatives,—

WILSON, McLAY, & CO.,

2, TALBOT COURT, GRACECHURCH STREET, LONDON, E.C.;

AND

87, ST. VINCENT STREET, GLASGOW.

THOMAS A. WARRINGTON,

CO-PATENTEE OF "THE POWER-JUMPER,"

SPECIAL JUMPER FOR MINING AND QUARRYING.

SOLE AND EXCLUSIVE AGENT FOR

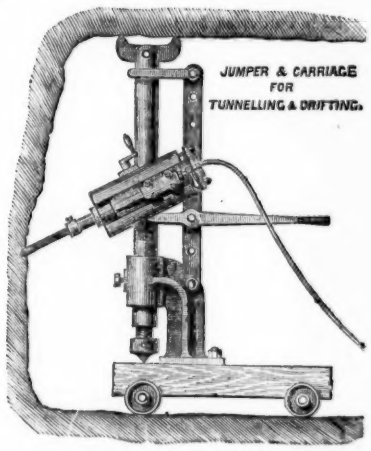
The "Rainotomon" Rock Drill,

FOR SIMPLICITY, ECONOMY, AND EFFICIENCY UNEQUALLED.

ENGINEER, AND CONTRACTOR FOR

MINING MACHINERY OF EVERY DESCRIPTION,

Rock Drills, Coal Cutters, Air Compressors, Winding and Pumping Machinery, Steam Boilers, Stone Breakers, Quartz Crushers, Stamps, &c.

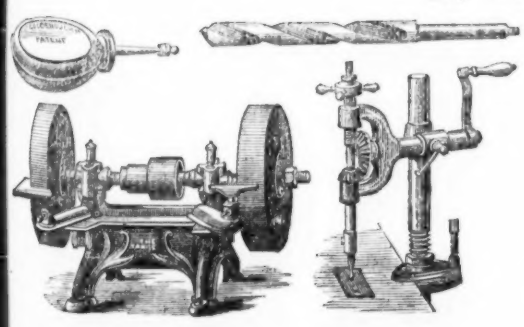


30, KING STREET, CHEAPSIDE, LONDON, E.C.

CHARLES CHURCHILL AND CO.,

IMPORTERS AND FACTORS OF AMERICAN MACHINERY AND TOOLS,

28, WILSON STREET, FINSBURY, LONDON, E.C.

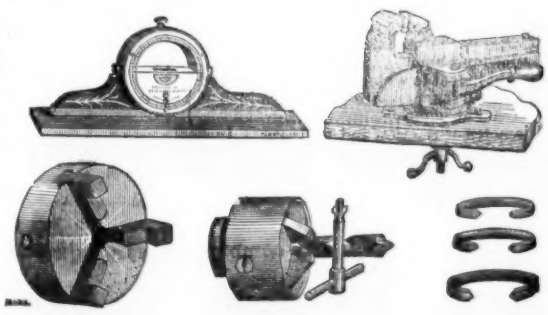


SOLE AGENTS FOR

Morse's Twist Drill, and Machine Company's celebrated Twist Drills and Chucks; American Scroll Chucks; Stephens' Patent Vices; Parker's Patent Parallel and Swivel Vices Gould Manufacturing Company's Well and Cistern Pumps; Washita, Arkansas, and Hindostan Oil Stones; and all other descriptions of American Tools and Machinery, &c., &c.

C. C. and Co. are prepared to give quotations and execute indents for American Goods of all descriptions, to be shipped to any port.

CATALOGUES AND PRICES CURRENT ON APPLICATION.



VIENNA EXHIBITION, GROUP XIII, STAND No. 457. INTERNATIONAL EXHIBITION, LONDON, No. 2 ENGINE SHED, WEST SIDE.

TANGYE BROTHERS AND HOLMAN,

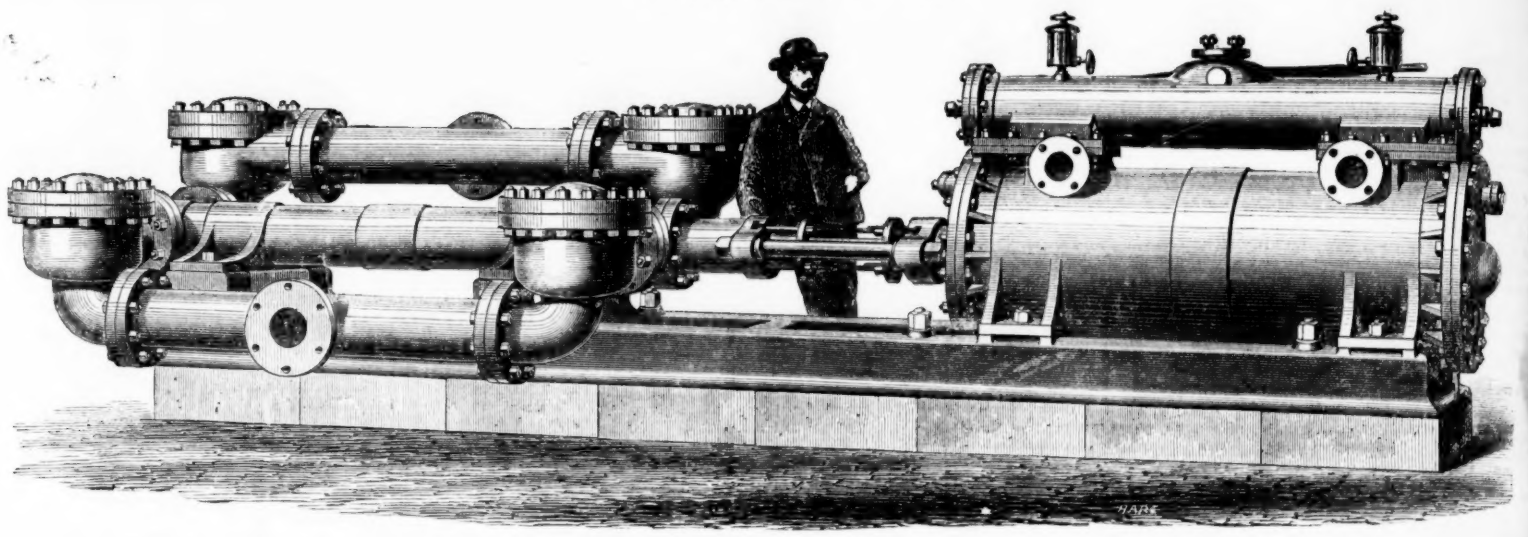
10, LAURENCE POUNTNEY LANE, LONDON,

CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,
NEWCASTLE-ON-TYYE (TANGYE BROTHERS AND RAKE), OFFICES AND WAREHOUSE, ST. NICHOLAS' BUILDINGS.
SOLE MAKERS OF

THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGINE

FOR FORCING WATER FROM MINES.

Nearly 3000 in Use.



The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or massive foundations, no repetition of Plunger Lifts, ponderous Connecting-rods, or complication of Pitwork, and allow a clear shaft for hauling purposes.

Extract from "ENGINEERING," September 6th, 1872:—

"The accompanying engraving illustrates a large specimen of the 'Special' Steam Pump, which was brought before the public about four years since by Messrs. Tangye Brothers and Holman. The Pump is the invention of Mr. S. Cameron, of New York, and since its introduction Messrs. Tangye have turned out nearly 3000 from their works.

"These pumps are of various sizes, and at first only small ones were made, but as their usefulness became developed the manufacturers designed pumping engines on the same principle for use in collieries. They were first applied to this purpose in the Newcastle collieries about three years since, and through the efforts of the late Mr. A. Stansfield Rake, under the direction of Messrs. Tangye, about 130 of these pumps had been introduced—principally in the collieries of the Durham and Newcastle districts, up to the end of 1870. They were adapted to perform the required duty—varying in almost every case—of forcing from 1000 to 10,000 gallons per hour from depths ranging from 100 to 500 ft. The succes of this system of pumps led Mr. J. Bigland, the manager of Messrs. Pease's Bishop Auckland Collieries, to conclude that it was adapted for yet heavier work. The result of his investigations into its working led to the manufacture of the engine we have illustrated, for the Adelaide Collieries, belonging to Messrs. Pease, at Bishop Auckland.

"The construction of the Special Steam Pump is so well known that we need now do no more than refer to the dimensions of the various parts. The steam cylinder is 26 in. diameter, and the pump—which is double acting—is 6¼ in. diameter, with a 6-ft. stroke. The slide valve is steam-moved, and its alternate action is effected by means of two steel reversing valves, operated by the piston in the interior of the cylinder at either end. Hence there is no external mechanism except the piston rod, a few inches only of which is seen reciprocating between the stuffing boxes of the steam and pump cylinders. In the contract it was stipulated that the engine should raise 120 gallons per minute 1040 ft. high in a single lift, and this is more than accomplished, with apparently as much ease as if its load was delivered at only 100 ft. high.

"The engine-room at the Adelaide Collieries is situated at a depth of 1040 ft. below the surface, and is an arched chamber, about 100 ft. long by 20 ft. wide, and 10 ft. high at centre. At the far end of this chamber is a double-flued boiler, 27 ft. long and 7 ft. in diameter. Placed between the boiler and the shaft is the pumping engine we have been describing. It was started on June 6, 1871, and Mr Bigland reported that, having measured its duty, he found the average of seven trials to be 137 gallons per minute, thus giving a higher duty than was stipulated for in the contract.

"A still larger Special Steam Pump than the one already described has since been made by Messrs. Tangye for Messrs. Stanniforth & Co., collieries, Silverdale, Staffordshire. The steam cylinder of this engine is 32 in. in diameter, and the water cylinder 10½ in.; the stroke 6 ft., and the engine has to raise 22,500 gallons per hour 560 ft. Two out of eight engines for some extensive coal mines in Germany are also in a forward state; each of these engines is to be capable of raising 150 gallons per minute, or 9000 gallons per hour, 700 high. This system of underground pumping engine undoubtedly carries with it the recommendations of simplicity and great power with a small number of mechanical parts. Its first cost is also moderate, as compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. Its practical value was tested in 1867 by the award of a silver medal by the Royal Polytechnic Society, which is composed chiefly of mining engineers. In fact, these engines appear to solve a very important commercial question in mining operations—viz., the most economical and effective means of deep mine drainage. Their success has been established in the coal mines of Durham and Newcastle, and there is no reason why their adoption should not follow, as occasion requires, in the copper and tin mines of Cornwall, some of which are of great depth; and especially for foreign mines, where transpopt convenience and economy are of paramount consideration."

The "Special" Steam Pumping Engines are in use at the following among many other Collieries:—

Adelaide Colliery, Bishop Auckland	3 Pumps.	North Bitchburn Colliery, Darlington	2 Pumps.	Stott, James and Company, Burslem	1 Pump.
Acomb Colliery, Hexham	1 „	Newton Cap Colliery, Darlington	1 „	Straker and Love, Brancepeth Colliery	1 „
Blackfell Colliery, Gateshead	1 „	Normanby Mines	1 „	Seaton Delaval Coal Colliery, near Newcastle	1 „
Black Boy Colliery, Gateshead	1 „	Oakenshaw Colliery	1 „	Thornley Colliery, Ferryhill	2 „
Castle Eden Colliery	2 „	Pease's West Colliery	2 „	Thompson, John, Gateshead	2 „
Carr, W. C., Newcastle	4 „	Pease, J. and J. W., near Crook	5 „	Trimdon Grange Colliery	1 „
Etherley Colliery	1 „	Pease, J. and J., Brandon Colliery	1 „	Tudhoe Colliery	4 „
Gidlow, T., Wigan	3 „	Pegswood Colliery, near Morpeth	2 „	Vobster and Mells Colliery	2 „
Haswell, Shotton and Easington Coal Company	3 „	Pelton Fell Colliery	1 „	Widdrington Colliery, Morpeth	5 „
Lochgelly Iron and Coal Company	2 „	Railey Fell Colliery, Darlington	1 „	Whitworth and Spennymoor Colliery	5 „
Lochore and Capeldrae Cannel Coal Company	6 „	Right Hon. Earl Durham, Fence Houses	1 „	Westerton Colliery, Bishop Auckland	1 „
Leather, J. T., near Leeds	2 „	Skelton Mines	1 „	Wardley Colliery, Gateshead	1 „
Lumley Colliery, Fence Houses	1 „	South Benwell Colliery	5 „	Westminster Brymbo Coal Company	2 „
Monkwearmouth Colliery, Sunderland	1 „	St. Helens (Tindale) Colliery	1 „	Weardale Coal and Iron Company	5 „

PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

Diameter of Steam Cylinder ...Inches	6	8	10	8	12	16	10	14	18	21	14	18	21	26	16	21	
Diameter of Water Cylinder ...Inches	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	
Length of Stroke ...Inches	24	24	36	24	36	48	24	36	36	48	36	36	48	72	36	48	
Strokes per minute ...	30	30	20	30	20	15	30	20	20	15	20	20	15	10	20	15	
Gallons per hour ...	2,200	2,200	2,200	3,900	3,900	3,900	6,100	6,100	6,100	6,100	8,800	8,800	8,800	8,800	11,900	11,900	11,9
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump ...	240	425	665	240	540	960	240	470	775	1,058	330	540	740	1,140	312	540	7
Diameter of Suction and Delivery ...Inches	2	2	2	3	3	3	3½	3½	3½	3½	4	4	4	4	5	5	
Diameter of Steam Inlet ...Inches	¾	1¼	1¼	1¼	2½	2½	1½	2½	3	3½	2½	3	3½	4	2½	3½	
Diameter of Exhaust ...Inches	1	1½	1½	1½	2½	3	1¾	2½	3½	4	2½	3½	4	5	3	4	

PARTICULARS, &c.—*Continued.*

Diameter of Steam Cylinder ...Inches	30	18	24	30	32	18	24	30	36	21	30	36	42	26	36	44	
Diameter of Water Cylinder ...Inches	7	8	8	8	8	9	9	9	9	10	10	10	10	12	12	12	
Diameter of Stroke ...Inches	72	36	48	72	72	36	48	48	72	48	72	72	72	48	72	72	
Strokes per minute ...	10	20	15	10	10	20	15	15	10	15	10	10	10	15	10	10	
Gallons per hour ...	11,900	15,660	15,660	15,660	15,660	19,800	19,800	19,800	19,800	24,400	24,400	24,400	24,400	35,240	35,240	35,240	35,2
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump ...	1,100	300	540	840	960	240	427	665	960	264	540	780	1,062	282	540	800	1,0
Diameter of Suction and Delivery ...Inches	5	6	6	6	6	7	7	7	7	8	8	8	8	10	10	10	
Diameter of Steam Inlet ...Inches	5	3	4	5	5½	3	4	5	6	3½	5	6	7	4	6	8	
Diameter of Exhaust ... Inches	6	3½	5	6	6½	3½	5	6	7	4	6	7	8	5	7	9	

PRICES OF THE ABOVE ON APPLICATION.

Any combination can be made between the Steam and Water Cylinders, to suit Height of Lift and Pressure of Steam.

TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney Lane, London, E.C.

Printed by RICHARD MIDDLETON, and published by RAILEY & GILBY (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—July 19, 1873.